Permit Fact Sheet

General Information

Permit Number:	WI-0026042-09-0
Permittee Name:	Domtar Paper Co LLC
Address:	210 N Grand Ave
City/State/Zip:	Rothschild WI 54474-1197
Discharge Location:	Outfall 010: 44º 53’ 18” N, 89º 37’ 49” W Outfall 011: 44º 53’ 35” N, 89º 37’ 36” W Outfall 012: 44º 53’ 30” N, 89º 37’ 40” W Outfall 013: 44º 53’ 37” N, 89º 37’ 34” W Outfall 015: 44º 53’ 38” N, 89º 37’ 34” W
Receiving Water:	Wisconsin River
StreamFlow ($Q_{7,10}$):	674 MGD
Stream Classification:	Warmwater Sport Fishery, non-community public water supply

Facility Description

Domtar Paper Co, LLC’s Rothschild mill (DRM) produces 180 TPD (tons per day) of calcium-based sulfite pulp from hardwood and 434 TPD of fine paper at its Rothschild mill. Since May 1998, the bleaching process performed at the pulp mill has been total chlorine free (TCF). In the fall of 2003, DRM shut down the smaller of its two paper machines. In late 2013, DRM’s treatment facility began accepting all process wastewaters from Wisconsin Electric Power Company (WEPC)’s 50 MW, biomass-fueled cogeneration facility at the Rothschild Mill site.

Wastewater Sources: Pulp and paper production at DRM generates process wastewaters and cooling waters. DRM also sends its spent pulping liquor (red liquor) to the adjoining Borregaard facility, a chemical recovery plant that manufactures lignosulfate products. In return, DRM collects and treats Borregaard’s red liquor evaporator condensate and other process wastewaters. Borregaard is authorized to discharge noncontact cooling water and process wastewaters under their own permit (WI-0003450). DRM also treats process wastewaters from the Wisconsin Electric Power Company’s cogeneration biomass facility, as described below. DRM stopped accepting leachate from the Marathon County, Midstate, Spickler, and Cleveland landfills since June 2020.

All process wastewaters from the cogeneration biomass facility are discharged to the mill’s wastewater treatment system and include boiler blowdown, cooling tower blowdown, and boiler water demineralization wastes, totaling 0.5 MGD on average. This flow is offset by reductions in wastewater generated by the mill. Additionally, the mill has retired its own boilers and now utilizes steam produced by the cogeneration facility.

In application for permit reissuance, DRM indicates that, on average, Borregaard’s process wastewaters comprise 6.2% (0.5 MGD) of the influent to DRM’s wastewater treatment system while landfill leachates comprise approximately 0.4% (0.03 MGD) and WEPC process waters comprise 4.2% (0.34 MGD).

Wastewater Treatment: DRM provides treatment for its own process wastewaters, leachates from four off-site landfills, WEPC’s process wastewaters, and Borregaard’s process wastewaters prior to discharge to the Wisconsin River. DRM’s

wastewater treatment system provides pH neutralization using lime, grit removal, and secondary biological treatment. The secondary treatment system includes two, 5.4-MG (million gallon) aeration channels and three secondary clarifiers, one with a capacity of 1.8 MG and two with capacities of 1.2 MG each. Since process wastewaters from the

Rothschild mill are nutrient deficient, DRM adds phosphoric acid and aqua ammonia to its treatment system to enhance biological treatment. DRM uses a heat exchanger to cool the Rothschild Mill's process wastewaters prior to treatment. Effluent volume and quality from DRM's wastewater treatment system in from 10/2015 – 3/2020 averaged 7.9 MGD, 754 lbs/day of BOD_5 (five-day biochemical oxygen demand) at 11.4 mg/L, 1481 lbs/day of TSS (total suspended solids) at 22.5 mg/L, and 19.8 lbs/day of total phosphorus at 0.3 mg/L. Also from 2016 - 2019, the Rothschild Mill discharged an average of 3.8 MGD of noncontact cooling water when discharge was occurring (highest during summer months). Finally, there were no chlorine limit exceedances at Outfall 015.

Effluent from DRM's wastewater treatment system is discharged to the Wisconsin River via a diffuser system. The diffuser system consists of eight, 4-inch diameter nozzles spaced approximately 19 feet apart along a 140-inch, 36-inch diameter pipe on the bed of the Wisconsin River. The discharge pipe is oriented perpendicular to the direction of flow in the river. All eight diffuser nozzles are angled 60 degrees above the bed of the river and provide a total outlet area of 0.698 square feet. Over the last permit term, the average daily velocity of effluent at the point of discharge from the diffuser ports was equal to or greater than 10 feet per second, constituting a zone of initial dilution (ZID), on 99 percent of days, with a discharge velocity of less than 10 ft/s on 16 total days from October 2015 through March 2020.

DRM uses two Klampresses (gravity belt thickeners and belt filter presses) to dewater its wastewater treatment system sludge. Prior to replacing the belt filter presses in December of 2004, DRM used wet-air oxidation to condition the sludge prior to dewatering. Following startup of the new belt filter presses, DRM discontinued conditioning its sludge prior to dewatering. From 2016 - 2019, DRM land applied an average of 1589 metric tons of sludge per year and sent an average of 124 metric tons of sludge to the Marathon County Landfill.

DRM sends its sanitary wastes to the Rib Mountain Metropolitan Sewerage District.

Expiration Date: The department anticipates an effective date of June 1, 2021 for the proposed permit. Therefore, to allow a full permit term of five years, the proposed permit's expiration date is May 31, 2026.

In tables, this fact sheet identifies any changes with a gray box. Please note that this fact sheet only identifies major changes to this WPDES permit. For a complete analysis of permit changes, please review the previous permit and consult with the permit drafter.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
901		Wisconsin River cooling water intake structure monitoring.
010		Wastewater treatment plant effluent shall be sampled prior to discharge via Outfall 010 to the Wisconsin River. Sampling shall be performed at the Parshall flume that follows the wastewater treatment plant's secondary clarifiers.
011		Pulp mill lift station overflow shall be sampled prior to discharge via Outfall 011 to the Wisconsin River.
012		Paper mill sump overflow shall be sampled prior to discharge via Outfall 012 to the Wisconsin River.
013		Wood room sump overflow shall be sampled prior to discharge via

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
		Outfall 013 to the Wisconsin River.
014		Sampling Point 014 represents the combined loadings from Outfalls 010, 011, 012, and 013.
015		Noncontact cooling waters from air conditioners, bearing cooling, air compressors and influent heat exchangers shall be sampled after mixing, but prior to discharge to the Wisconsin River via Outfall 015.
016		At Sampling Point 016, wastewater treatment system sludge shall be sampled prior to land application.
018		Fire system testing water shall be sampled prior to discharge to the Wisconsin River through stormwater outfall 03 or 02.
102		Wastewaters from the bleach plant and pulp mill combined with evaporator condensate shall be sampled at the pulp mill lift station prior to discharge to the wastewater treatment system.
104		Field blank to accompany mercury monitoring.

1 Influent – Cooling Water Intake Structure

1.1 Sampling Point(s)

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
901		Wisconsin River cooling water intake structure requirements

1.2 Monitoring Requirements and BTA Determinations

1.2.1 Sample Point Number: 901- WI River CWIS Requirements

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	
Intake Water Used Exclusively For Cooling		Percent	Annual	Calculated	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Grab	Voluntary Sampling

Changes from Previous Permit

Requirements such as an Entrainment Characterization study, Visual Inspections, and Impingement Mortality monitoring have been removed.

The permittee is now required to annually report the percentage of water used exclusively for cooling.

The permittee is now required to report the monthly average daily intake flow rate on a monthly basis.

The permittee is now required to provide annual updates on the cooling water recovery system.

Monitoring for mercury is included, as Sampling Point 601 is inactivated.

Explanation of Limits and Monitoring Requirements

The requirements of this section of the permit are consistent with other facilities which the department has determined are subject to the federal requirements found in 40 CFR 125, Subpart J. For a complete analysis of the full BTA determination for this intake structure, please see Appendix C below.

Monitoring for percent of water used exclusively for cooling is included in order to ensure collection of data necessary to determine whether NR 111, Wis. Adm. Code, applies at the time of the next permit application.

The purpose of the annual updates for the cooling water recovery system is to ensure that the system is optimized, maximizing the amount of water that can be recycled.

2 Inplant - Proposed Monitoring and Limitations

2.1 Sampling Point(s)

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
102		Wastewaters from the bleach plant and pulp mill combined with evaporator condensate shall be sampled at the pulp mill lift station prior to discharge to the wastewater treatment system.
104		Field blank to accompany mercury monitoring.

Changes from Previous Permit:

No changes.

2.2 Monitoring Requirements and Limitations

2.2.1 Sample Point Number: 102- PULP MILL LIFT STATION

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Continuous	
AOX	Daily Max	35 lbs/day	Quarterly	Calculated	
AOX		ug/L	Quarterly	24-Hr Flow Prop Comp	

Changes from Previous Permit:

Effluent limitation for AOX changed from 40 lbs/day to 35 lbs/day based on discharge data.

Explanation of Limits and Monitoring Requirements

Prior to the issuance of the Rothschild Mill's current permit, the U.S. Environmental Protection Agency (EPA) promulgated effluent limitations and air emission standards to control the release of toxic and nonconventional pollutants from bleached kraft and papergrade sulfite mills. The federal regulation, which amended 40 CFR 430, is commonly known as the Cluster Rule. For calcium-based papergrade sulfite mills, 40 CFR 430.54(a)(1) imposes a daily maximum effluent limit of <20 µg/L for AOX. EPA concluded that most papergrade sulfite mills can meet the AOX limit by eliminating all forms of chlorine from pulp bleaching operations. That is, by converting bleach plants to totally chlorine-free (TCF) bleaching. EPA recognizes, however, that a kraft or papergrade sulfite mill may have additional production processes that are potential sources of AOX, but are not regulated by the Cluster Rule.

EPA also suggests that for a mill with more than one production process, AOX effluent limits should be set equal to the sum of the AOX limits that are derived for each production process. The Cluster Rule's preamble adds that the permit drafter should use best professional judgment to establish AOX effluent limits for production processes, such as paper production from pulp that is purchased from another mill, that are not covered by the Cluster Rule (63 FR 18569). Even if the producer of the market pulp is a kraft mill, which is covered by the Cluster Rule, the pulp may contain AOX since the Cluster Rule does not require kraft mills to use TCF (total chlorine free) bleaching.

EPA also recognizes that AOX may be present in the discharge from a sulfite pulp bleach plant even though the bleaching process is TCF. In its permit guidance document, EPA suggests that permit drafters use best professional judgment to develop a no-net discharge, mass-based AOX limit for a pulp bleach plant where whitewater recycling is practiced and the mill has measurable AOX levels due to their use of non-TCF purchased pulp (EPA-821-B-00-003, May 2000). A no-net discharge limit restricts the discharge of AOX from the bleaching of the pulp to zero while recognizing the presence of AOX from other sources.

Derivation of DRM's AOX Limit

Process variability at the Rothschild Mill, such as the variability of AOX levels in purchased kraft pulps and AOX generation during intake water treatment have increased the amount of AOX present at the Rothschild Mill. Data for Sampling Point 102 (see Appendix A) demonstrates this variability. During the last two permit terms, DRM has used and continues to use TCF bleaching. Additionally, the Mill ownership and the National Council for Air and Stream Improvement performed a study to demonstrate that there is no net discharge of AOX from the pulp bleach plant.

Because AOX levels at the Rothschild Mill have varied while pulp bleaching remains TCF, it is appropriate for the department to use a no-net discharge, mass-based AOX limit. Estimating the upper 99th percentile of AOX data that were collected during the last 15 years results in a daily maximum effluent limit of 35 lbs/day. Because this is less than the current limit of 40 lbs/day used in the current permit and because no AOX samples exceeded this number during the last

permit term, it is the department's opinion that the proposed effluent limitation of 35 lbs/day can be consistently met. Therefore, the limit will be reduced to 35 lbs/day of AOX.

2.2.2 Sample Point Number: 104- MERCURY FIELD BLANK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Blank	

Changes from Previous Permit:

No changes

Explanation of Limits and Monitoring Requirements

This portion of the permit is reserved for reporting mercury field blank data to ensure accuracy of mercury data.

2.3 BMPs for Spent Pulping Liquor Management, Spill Prevention and Control

Changes from Previous Permit:

No changes.

Explanation of Monitoring Requirements

As with the previous permit, best management practices (BMPs) from 40 CFR 430.03 are included in the proposed permit. The BMP language has been updated to match language in 40 CFR 430.03. DRM has prepared and implemented a BMP plan over the last ten years.

3 Surface Water - Proposed Monitoring and Limitations

3.1 Sampling Point(s)

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
010		Wastewater treatment plant effluent shall be sampled prior to discharge via Outfall 010 to the Wisconsin River. Sampling shall be performed at the Parshall flume that follows the wastewater treatment plant's secondary clarifiers.
011		Pulp mill lift station overflow shall be sampled prior to discharge via Outfall 011 to the Wisconsin River.
012		Paper mill sump overflow shall be sampled prior to discharge via Outfall 012 to the Wisconsin River.
013		Wood room sump overflow shall be sampled prior to discharge via

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
		Outfall 013 to the Wisconsin River.
014		Sampling Point 014 represents the combined loadings from Outfalls 010, 011, 012, and 013.
015		Noncontact cooling waters from air conditioners, bearing cooling, air compressors and influent heat exchangers shall be sampled after mixing, but prior to discharge to the Wisconsin River via Outfall 015.
016		At Sampling Point 016, wastewater treatment system sludge shall be sampled prior to land application.
018		Fire system testing water shall be sampled prior to discharge to the Wisconsin River through stormwater outfall 003.

Changes from Previous Permit:

Outfall 018 has been added to provide a reporting blank for when DRM decides to test their fire system.

3.2 Monitoring Requirements and Limitations

3.2.1 Sample Point Number: 010- WWTP EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		lbs/day	2/Week	24-Hr Flow Prop Comp	Additional monitoring required as specified in "BOD5, Total Suspended Solids and Phosphorus Monitoring Frequencies."
Suspended Solids, Total		lbs/day	2/Week	24-Hr Flow Prop Comp	Additional monitoring required as specified in "BOD5, Total Suspended Solids and Phosphorus Monitoring Frequencies."
Temperature Maximum		deg F	Daily	Continuous	See subsection on Temperature Monitoring below.
Phosphorus, Total		mg/L	3/Week	24-Hr Flow Prop Comp	Additional monitoring required as specified in

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					"BOD5, Total Suspended Solids and Phosphorus Monitoring Frequencies."
Mercury, Total Recoverable	Monthly Avg	9.3 ng/L	Quarterly	Grab	
Mercury, Total Recoverable	Monthly Avg	400 grams/day	Quarterly	Calculated	
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Chronic WET testing required during the quarters specified below in "Whole Effluent Toxicity (WET) Testing."
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Acute WET testing required during the quarters specified below in "Whole Effluent Toxicity (WET) Testing." Use this cell on the DMR (TUa) when there is not a ZID (discharge <10 fps).
Acute WET		rTUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Acute WET testing required during the quarters specified below in "Whole Effluent Toxicity (WET) Testing." Use this cell on the DMR (rTUa) when there is a ZID (discharge >10 fps).
PFAS		ng/L	Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on Updated DNR PFAS List.

Changes from Previous Permit

Monitoring frequency for BOD_5 and TSS has been reduced from 3x/week to 2x/week.

A concentration-based effluent limitation of 9.3 ng/L and a mass-based effluent limitation of 400g/day have been added for mercury.

Annual monitoring for PFAS is now included.

Explanation of Limits and Monitoring Requirements

Because of the consistency of the reported BOD_5 and TSS data, and also because of the BMP program that is being implemented at DRM, the department has made the determination that there is a very low risk of BOD_5 and TSS

exceedances (see Appendix A). Using EPA's 1996 *Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* as the basis, DRM is eligible for reduced monitoring frequencies for both of these pollutants.

Mercury results obtained from the past permit term indicated that an effluent limitation is necessary, both on a mass and concentration basis, see the WQBEL memo (Appendix E), for a complete justification.

The permittee submitted preliminary PFAS data while the permit was being drafted. Even though the sampling results indicated levels that the department does not deem a concern, the permittee and the department have agreed to include ongoing annual monitoring for PFAS in the process wastestream in order to assess PFAS loadings over the next permit term. At the time of permit reissuance, the department does not have promulgated PFAS criteria, but it is anticipated that these criteria will be effective during the next permit reissuance.

Biomass Cogeneration Process Wastewater

Since 2014, DRM has accepted boiler blowdown, cooling tower blowdown, and boiler demineralization wastewaters from their biomass cogeneration facility, which, based on data provided in their WPDES permit application, comprises approximately 4% of the effluent by volume. For the previous reissuance, the department addressed the issue of technology-based effluent limitations for this waste stream by comparing historic effluent data with effluent data from when the WWTP began to accept the cogeneration facility's process wastewater. 40 CFR part 423, which addresses discharges from Steam Electric Power Generating (SEPG) point sources, only applies to facilities "whose generation of electricity results primarily from a process utilizing fossil-type fuel (coal, oil, or gas), fuel derived from fossil fuel (e.g., petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium." However, due to the similarities in wastewater characteristics between the biomass cogeneration facility and facilities that fall into the SEPG category, the department evaluated 40 CFR 423 for potential technology-based effluent limitations using best professional judgement.

40 CFR §423.15(10)(i) outlines New Source Performance Standards for Cooling Tower Blowdown. This portion of federal code indicates that there are daily maximum and monthly average effluent limits for Free Available Chlorine., along with chromium, zinc, and 126 priority pollutants (found in 40 CFR 423 Appendix A). DRM has confirmed their use of bleach to minimize bacteria growth in the co-gen biomass cooling towers, so the department's primary concern with the presence of chlorine in the WWTF is the formation of dioxins/furans as that waste stream commingles with the process waste stream. However, DRM provided the department with their most recent sampling instance for dioxins/furans in their effluent, and this data shows that they are not present at detectable levels. Additionally, the permit application shows that chromium, zinc, and the priority pollutant scan did not yield effluent concentrations at levels that the department deems a concern. Therefore, no additional best professional judgement technology-based effluent limitations are recommended at this time for the co-gen waste streams.

3.2.2 Sample Point Number: 011- PULP MILL EMERGENCY OVERFLOW; 012- PAPER MILL EMERGENCY OVERFLOW; 013- WOOD ROOM EMERGENCY OVERFLOW

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Estimated	
BOD5, Total		lbs/day	Daily	Grab Comp	
Suspended Solids, Total		lbs/day	Daily	Grab Comp	
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	5.0 su	Daily	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		mg/L	Daily	Grab Comp	

Changes from Previous Permit

No changes.

3.2.3 Sample Point Number: 014- 010, 011, 012 & 013 COMBINED

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Calculated	
BOD5, Total	Daily Max	14,876 lbs/day	2/Week	Calculated	
BOD5, Total	Monthly Avg	7,739 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Daily Max	21,410 lbs/day	2/Week	Calculated	
Suspended Solids, Total	Monthly Avg	11,511 lbs/day	2/Week	Calculated	
Phosphorus, Total	Rolling 12 Month Avg	0.42 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	33 lbs/day	3/Week	Calculated	
Phosphorus, Total		lbs/month	Monthly	Calculated	
Phosphorus, Total		lbs/yr	Monthly	Calculated	Rolling 12-month sum
WLA Previous Day River Flow		cfs	2/Week	Continuous	
WLA Previous Day River Temp		deg F	2/Week	Continuous	
WLA Value		lbs/day	2/Week	Calculated	
WLA BOD5 Discharged	Daily Max - Variable	lbs/day	2/Week	Calculated	

Changes from Previous Permit

Technology-based effluent limitations (TBELs) were calculated using production data for the previous four years (2016 – 2019); this data showed that the limits should be lowered.

Monitoring frequency for BOD_5, TSS, and WLA determinations were decreased from 3/week to 2/week.

A monthly average effluent limitation for phosphorus of 33 lbs/day was added.

Explanation of Limits and Monitoring Requirements

TBELs for BOD_5 and TSS were calculated in accordance with ch. NR 284, Wis. Adm. Code. For more information on how these limits were derived, see Appendix B.

The Wisconsin River Basin Total Maximum Daily Load (TMDL) was approved by the EPA during the current permit term. Because of this, a new, mass-based phosphorus limitation will now be in effect. Based on discharge data (see Appendix A), the department believes that DRM will be able to meet this limitation.

3.2.4 Sample Point Number: 015- NCCW

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Temperature Maximum		deg F	Daily	Continuous	
Chlorine, Total Residual	Daily Max	38 ug/L	Quarterly	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	Quarterly	Grab	

Changes from Previous Permit

A monthly average effluent limitation of 38 ug/L (equal to the daily maximum average) has been added.

Explanation of Limits and Monitoring Requirements

Expression of limits requirements in s. NR 106.07(4), Wis. Adm. Code, indicate that whenever a daily maximum limitation is determined necessary to protect water quality, a monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality (see Appendix E).

3.2.5 Sample Point Number: 018- FIRE SYSTEM TEST WATER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		gpd	Daily	Estimated	
Suspended Solids, Total	Daily Max	40 mg/L	Monthly	Grab	
pH (Minimum)	Daily Min	6.0 su	Monthly	Grab	
pH (Maximum)	Daily Max	9.0 su	Monthly	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chlorine, Total Residual	Daily Max	38 ug/L	Monthly	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	Monthly	Grab	

Changes from Previous Permit

This is a new sampling point, with monitoring requirements from the WPDES General Permit no. WI-0057681-4 included.

Explanation of Limits and Monitoring Requirements

To eliminate the need for a general permit for discharge of fire system test water, this outfall has been added for compliance purposes. The monitoring requirements are similar to what the general WPDES permit specifies, but have been tailored to DRM's specific discharge. Monitoring for Dissolved Oxygen (DO) and Oil & Grease are not required as the pipes that are utilized have never contained petroleum products and DO scavengers are not used. Monitoring for chlorine is included as chlorine is added to the source water. Though the WPDES General Permit for Hydrostatic/Test Water does not currently include monitoring/a limitation for Total Residual Chlorine, it is anticipated that the GP will be reissued with a corresponding monitoring requirement and effluent limitation. Also, the department has reason to believe that compliance with the chlorine limitation is feasible, as the department had requested that DRM sample for TRC with their most recent test of the fire system and the result had come back as non-detectable.

4 Land Application - Sludge

Sample Point Number: 016- UNCONDITIONED SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Quarterly	Grab	
Nitrogen, Total Kjeldahl		Percent	Quarterly	Grab	
Nitrogen, Ammonia (NH3-N) Total		Percent	Quarterly	Grab	
Nitrogen, Nitrite + Nitrate Total		Percent	Once	Grab Comp	Sample once in 2024.
pH Field		su	Annual	Grab	
Phosphorus, Total		Percent	Annual	Grab Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Water Extractable		% of Tot P	Annual	Grab Comp	
Potassium, Total Recoverable		Percent	Annual	Grab Comp	
Chloride		Percent	Annual	Grab Comp	
Cadmium Dry Wt		mg/kg	Annual	Grab Comp	
Copper Dry Wt		mg/kg	Annual	Grab Comp	
Lead Dry Wt		mg/kg	Annual	Grab Comp	
Nickel Dry Wt		mg/kg	Annual	Grab Comp	
Zinc Dry Wt		mg/kg	Annual	Grab Comp	
Fluoride		mg/kg	Once	Grab Comp	Sample once in 2024.
Sulfate, Total		mg/kg	Once	Grab Comp	Sample once in 2024.
Aluminum Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Barium, Total Recoverable		mg/kg	Once	Grab Comp	Sample once in 2024.
Boron Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Calcium Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Iron Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Magnesium Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Manganese Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Molybdenum Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Sodium Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
Strontium		mg/kg	Once	Grab Comp	Sample once in 2024.
PCB Total Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2024.
PFAS		ng/kg	Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on Updated DNR PFAS List.
Dioxins & Furans (all congeners)			Once	Grab Comp	As specified in s. NR 106.115, Wis. Adm. Code. Sample once in 2024.
Priority Pollutant Scan			Once	Grab Comp	As specified in s. NR 215.03(1-6), Wis. Adm. Code (excluding asbestos).

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Sample once in 2024.

Changes from Previous Permit:

For any parameter (except pH) that is required to be sampled once in 2024 or annually, the "sample type" has been changed from "Grab" to "Grab Composite".

Chloride monitoring is now required annually, changed from "Once".

Formatting in the above table was changed to condense the Dioxin and Furan components into one row.

Water Extractable Phosphorus (WEP) has been added as a required parameter on an annual basis.

Annual PFAS monitoring is included.

Explanation of Limits and Monitoring Requirements

This permit now requires that DRM take a grab composite sample because it's understood to be more representative of the sludge than a grab sample. Because the permit only requires annual or once per term monitoring for a large number of parameters, uncertainty is introduced as to the representativeness of the sample. The sample type for the Quarterly monitoring parameters remain at "Grab" because the uncertainty with the data is lessened when the monitoring frequency is increased.

Because there is a loading limitation of 170 lbs/acre/year or 340 lbs/acre/2 years for chloride in NR 214, annual monitoring for chloride is included to properly assess compliance with this permit requirement.

Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

Annual monitoring for PFAS is included in order to assess PFAS loadings over the course of the permit term. This data may be used to evaluate whether any additional limitations should be applied to the sludge during the next permit reissuance.

5 Schedules

5.1 Water Intake Requirements

The requirements of this schedule are only valid so long as the federal Final Regulations on Cooling Water Intake Structures (40 CFR 122.21(r) and 40 CFR 125.90-98) are in effect.

Required Action	Due Date
Annual Certification: Submit annual certification on the water intake structure, as specified in 1.3.5.1.	01/31/2022

Required Action	Due Date
Annual Certification: Submit annual certification on the water intake structure, as specified in 1.3.5.1.	01/31/2022
Annual Certification: Submit annual certification on the water intake structure, as specified in 1.3.5.1.	01/31/2023
Annual Certification: Submit annual certification on the water intake structure, as specified in 1.3.5.1.	01/31/2024
Annual Certification: Submit annual certification on the water intake structure, as specified in 1.3.5.1.	01/31/2025
Annual Certification: Submit annual certification on the water intake structure, as specified in 1.3.5.1.	01/31/2026
Entrainment and Impingement Sampling : The permittee shall complete entrainment and impingement monitoring in accordance with ss. 1.3.2 and 1.3.3 of this permit.	07/31/2025
Application Materials required under 40 CFR 122.21(r): The permittee shall submit the application materials required under 40 CFR 122.21(r) with the application for the tenth reissuance of this permit.	09/30/2025

5.2 BMP Reporting Requirements

Required Action	Due Date
Annual Report #1: Submit first annual report on daily BMP monitoring.	02/15/2022
Annual Report #2: Submit second annual report on daily BMP monitoring.	02/15/2023
Annual Report #3: Submit third annual report on daily BMP monitoring.	02/15/2024
Annual Report #4: Submit fourth annual report on daily BMP monitoring.	02/15/2025
Annual Report #5: Submit fifth annual report on daily BMP monitoring.	02/15/2026
Ongoing Annual Reports: The permittee shall continue to submit annual reports on daily BMP monitoring on 2/15 of each year in the event that this permit is not reissued on time.	

5.3 Certification of Total Chlorine Free Pulp Bleaching

Required Action	Due Date
TCF Certification: Submit certification that pulp bleaching is TCF.	12/31/2025

5.4 Land Management Plan

Required Action	Due Date
Land Management Plan: Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with Wisconsin Administrative Code NR 214.	09/30/2021

Explanation of Compliance Schedules

Because compliance with the Phosphorus WQBELs can be currently achieved, the compliance schedule for phosphorus has been removed from this permit.

Ongoing annual reports are included in case this permit is backlogged in the future. This is to ensure that DRM remains committed to their BMP program.

DRM should update their LMP to incorporate the new sampling requirement of Grab Composite samples once in 2024 and annually for certain parameters.

Attachments:

Appendix A: Electronic DMR Data, 10/2015 – 3/2020
Appendix B: Technology-Based Effluent Limitations
Appendix C: CWIS BTA Determination
Appendix D: Substantial Compliance Determination
Appendix E: WQBEL Memo

Proposed Expiration Date:
12/31/2025

Prepared By:
Nate Willis
Wastewater Engineer
Bureau of Water Quality

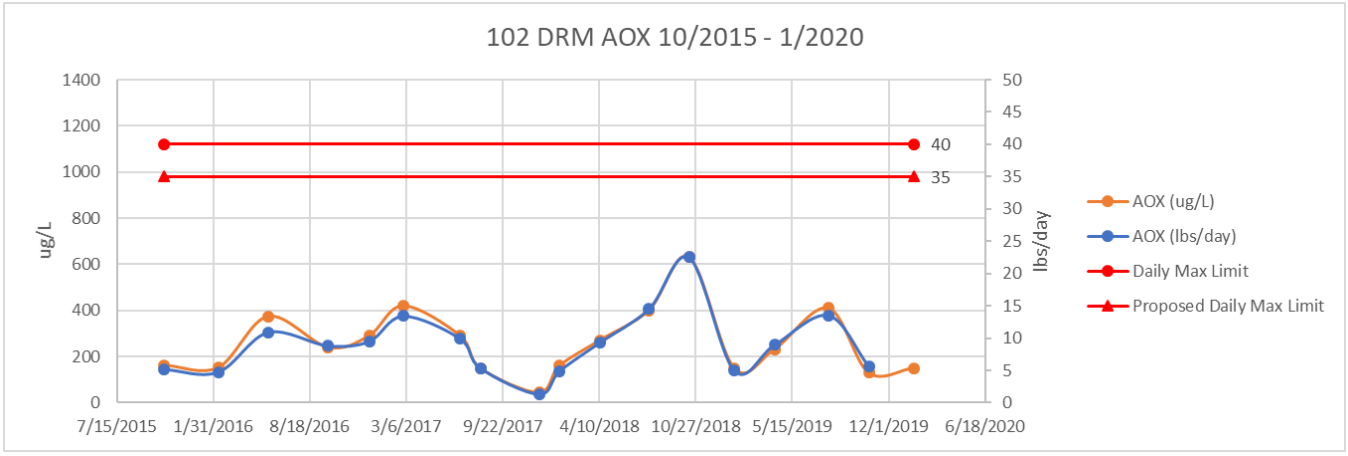
Date:
04/08/2021

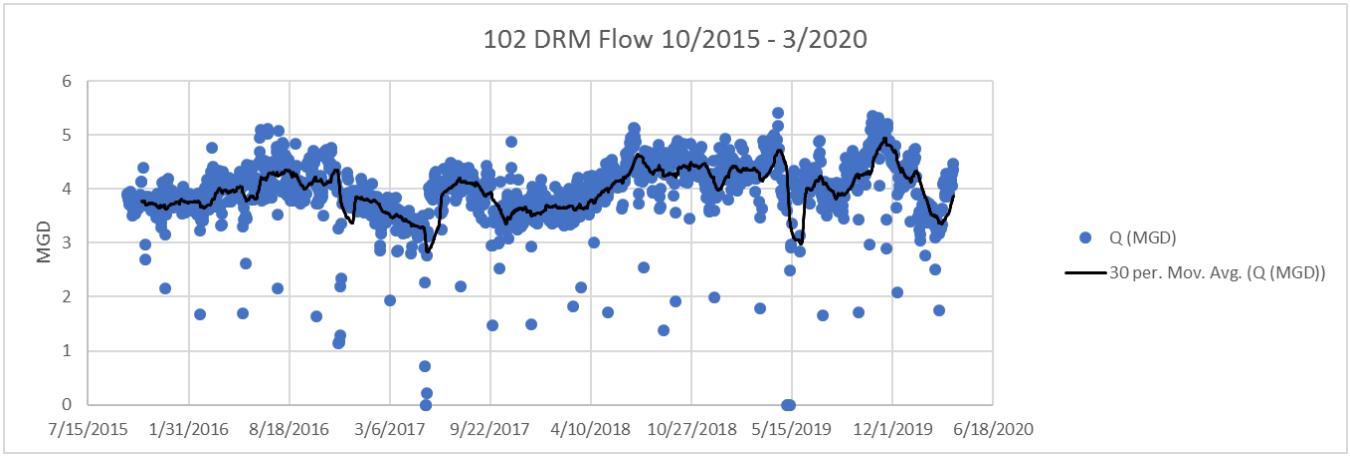
cc:
Nicholas Lindstrom, *WDNR*

APPENDIX A

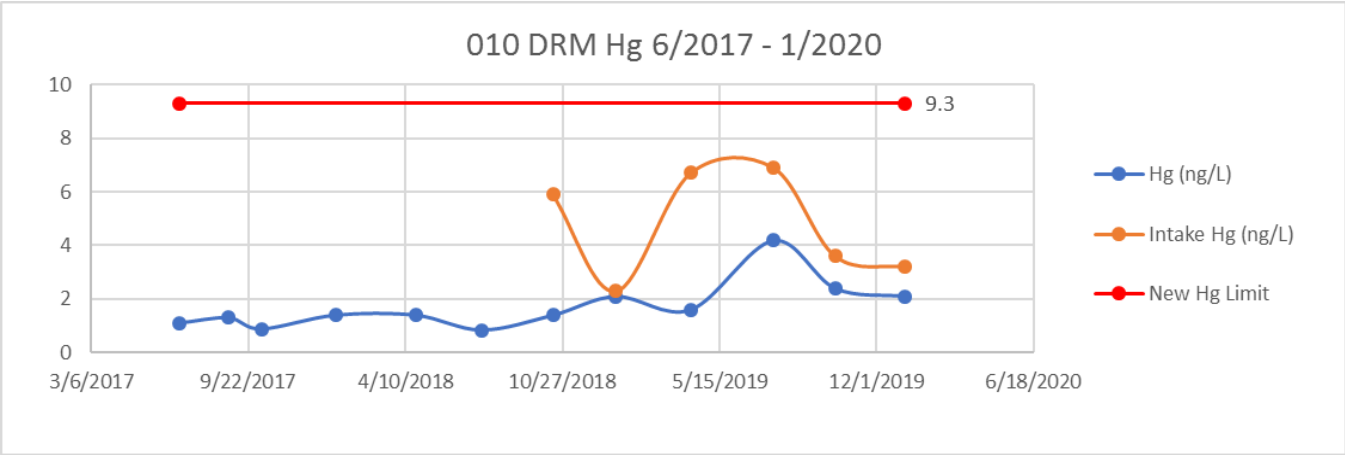
ELECTRONIC DISCHARGE MONITORING DATA, 10/2015 – 3/2020

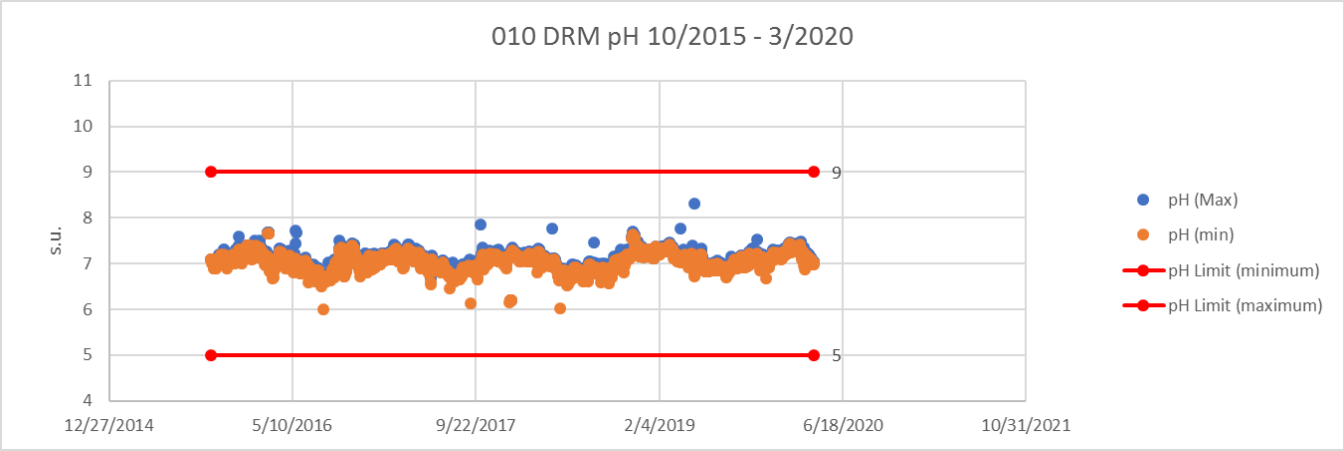
Sampling Point 102:

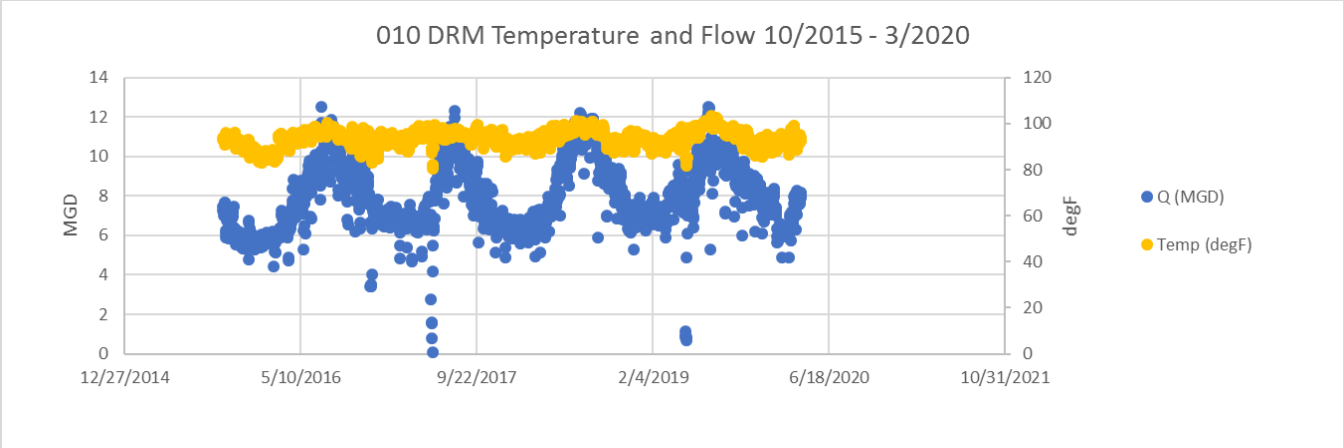


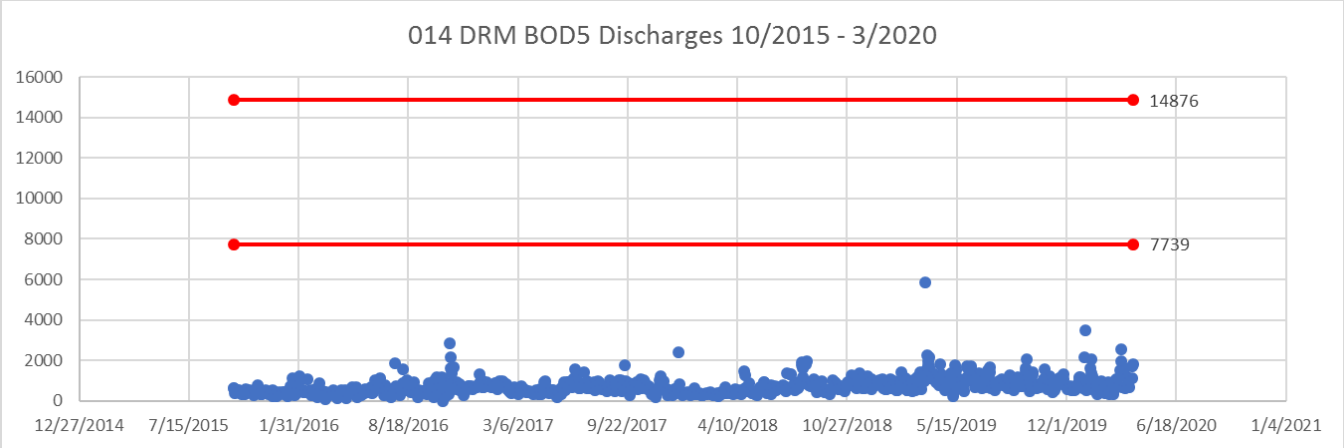


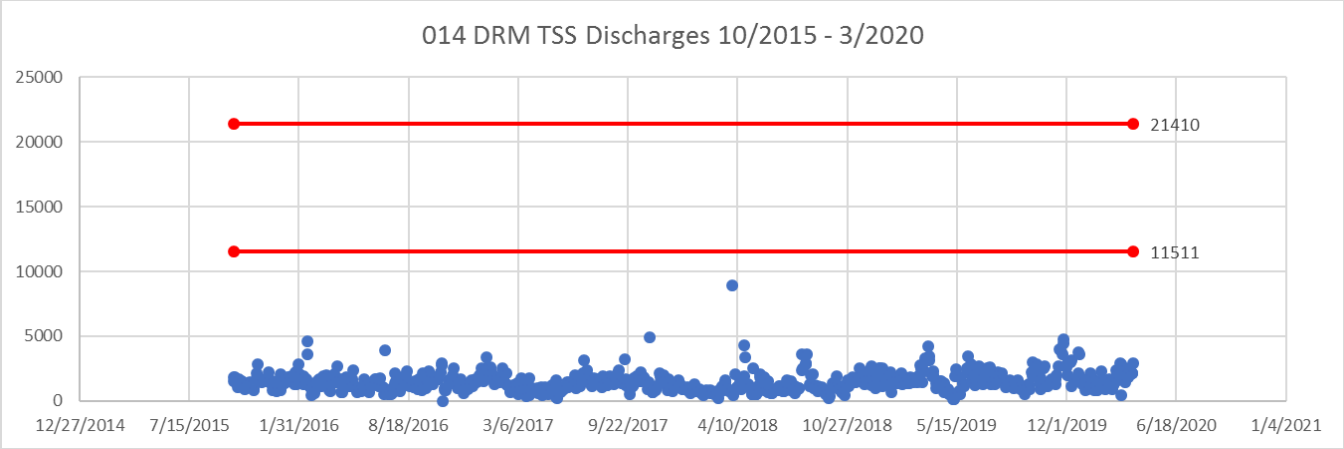
Outfall 010/014:

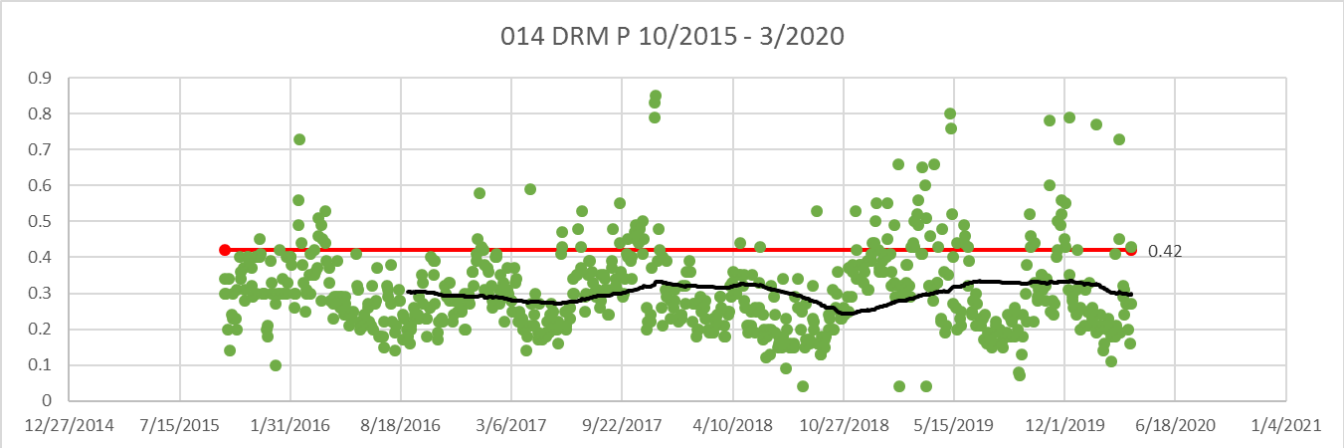


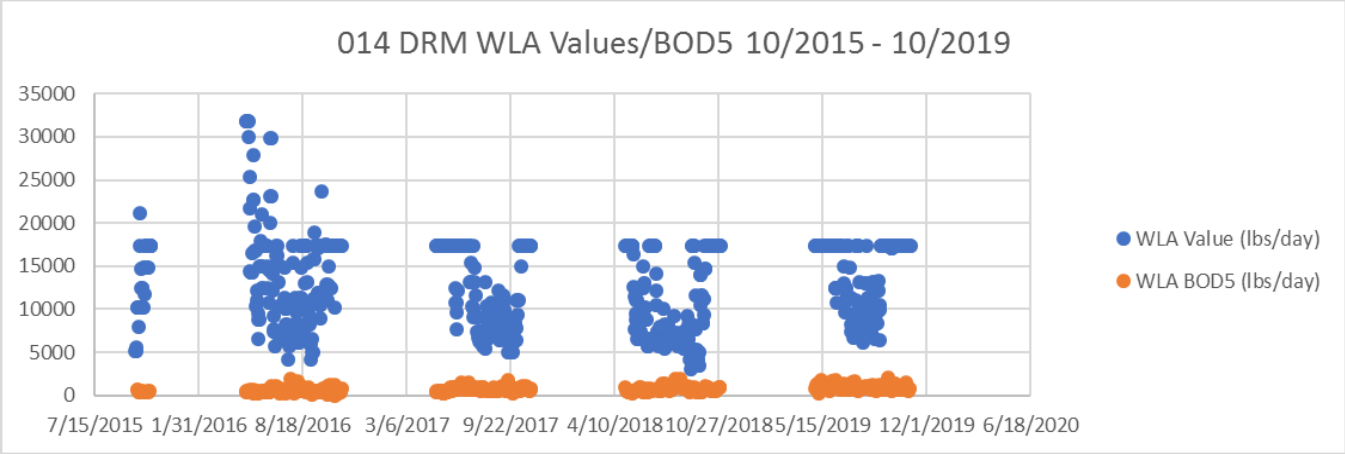


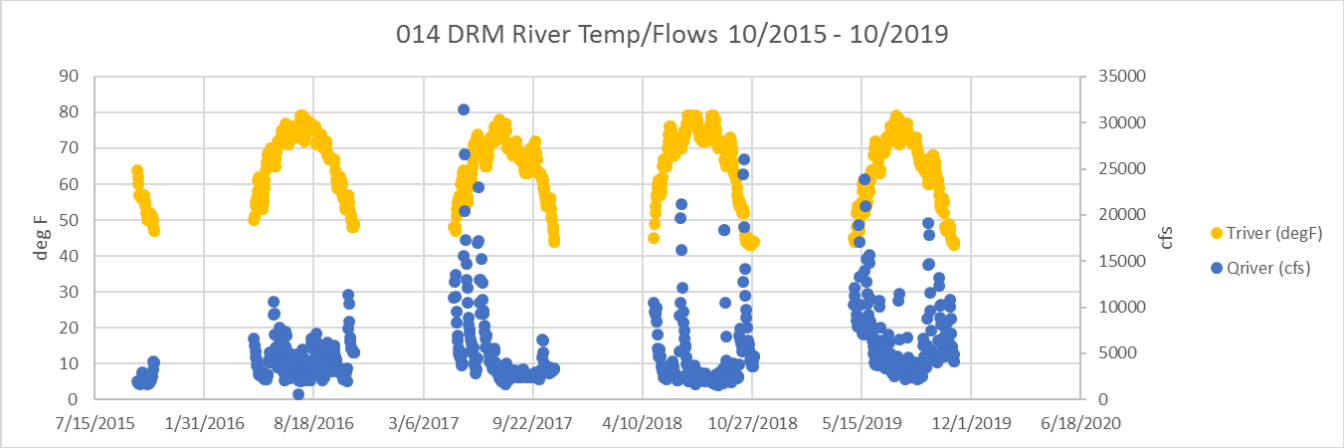



014 DRM BOD5 Discharges 10/2015 - 3/2020
16000
14000
12000
10000
8000
6000
4000
2000
0
14876
7739
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
1/4/2021

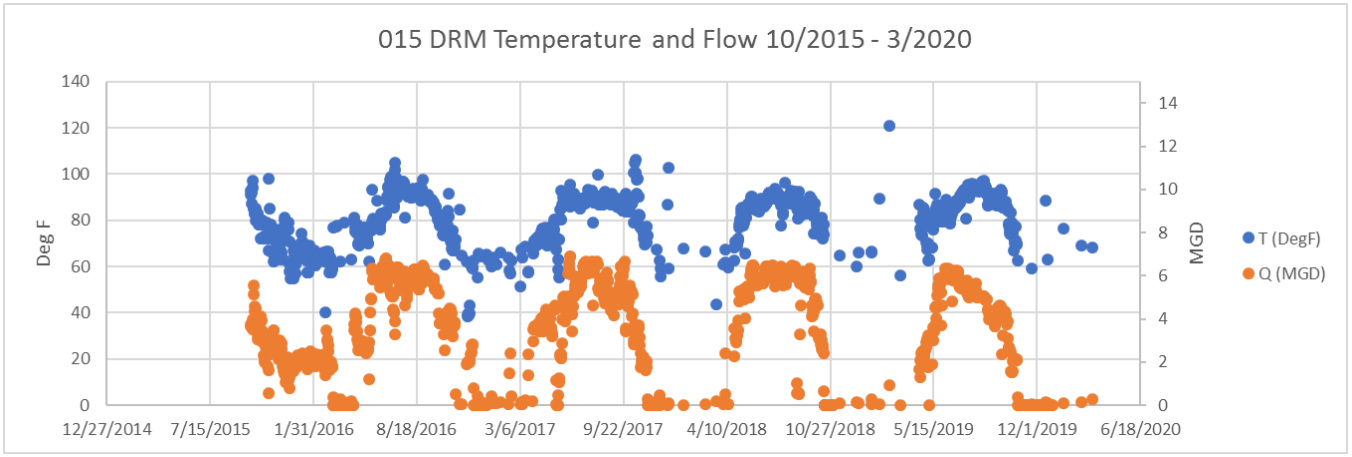

014 DRM TSS Discharges 10/2015 - 3/2020
25000
20000
15000
10000
5000
0
21410
11511
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
1/4/2021

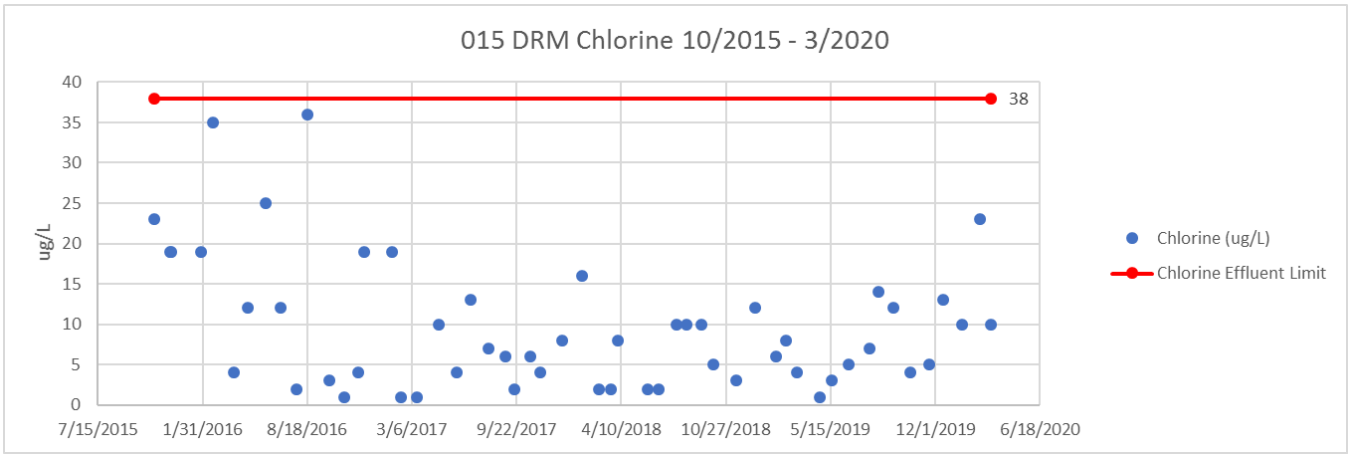

014 DRM P 10/2015 - 3/2020
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.42
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
1/4/2021


014 DRM WLA Values/BOD5 10/2015 - 10/2019
35000
30000
25000
20000
15000
10000
5000
0
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
WLA Value (lbs/day)
WLA BOD5 (lbs/day)


014 DRM River Temp/Flows 10/2015 - 10/2019
deg F
cfs
90
80
70
60
50
40
30
20
10
0
35000
30000
25000
20000
15000
10000
5000
0
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020
Triver (degF)
Qriver (cfs)

Outfall 015:


015 DRM Temperature and Flow 10/2015 - 3/2020
Deg F
MGD
T (DegF)
Q (MGD)
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020


015 DRM Chlorine 10/2015 - 3/2020
ug/L
38
Chlorine (ug/L)
Chlorine Effluent Limit
7/15/2015
1/31/2016
8/18/2016
3/6/2017
9/22/2017
4/10/2018
10/27/2018
5/15/2019
12/1/2019
6/18/2020

Outfall 016 (Landspreading of Sludge):

Date	NH3-N (%)	TKN (%)	Solids (%)
11/11/2015	0.033	3.44	20
3/1/2016	0.03	3.2	17
5/11/2016	0.04	3.1	17
8/17/2016	0.12	4.9	17.2
11/22/2016	0.11	4.3	18
3/15/2017	0.204	3.53	16
5/9/2017	0.0646	3.6581	16
9/6/2017	0.1	4.9	17.4
10/10/2017	0.18	4.96	17
1/9/2018	0.078	5.3	16.5
4/11/2018	0.092	5.1	16.8
7/23/2018	0.032	4.1	17.4
10/15/2018	0.052	3.1	15.6
1/16/2019	0.055	4.6	15.2
4/8/2019	0.066	4.8	16.9
10/15/2019	0.035	3.7	19.8
7/23/2019	0.08	4	18.5

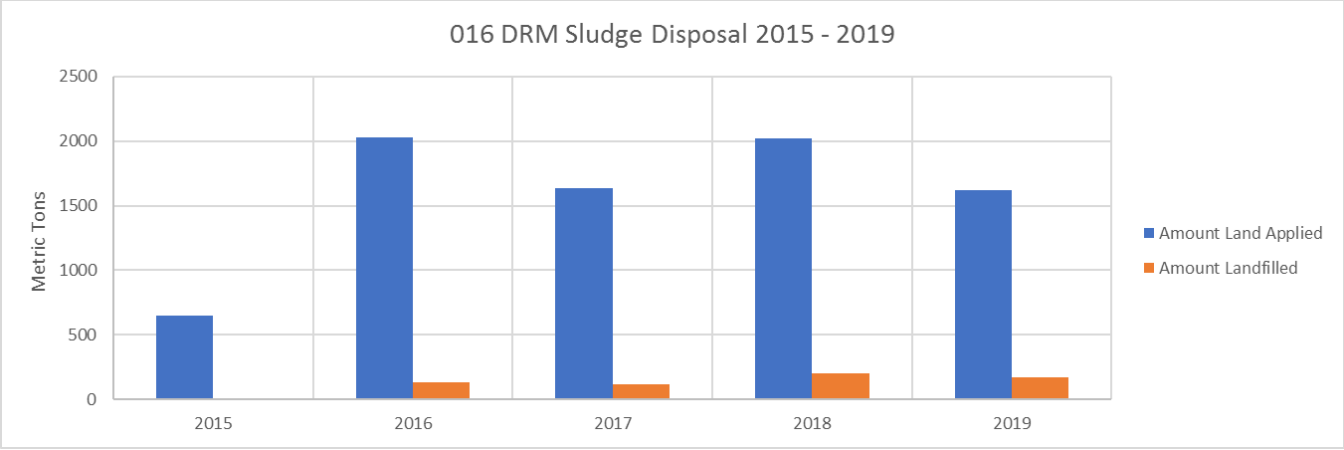
Date	Cd (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	pH	P (%)	K (%)	Zn (mg/kg)
5/11/2016	0.37	18	2.5	5.3	7.2	0.6	0.27	21
6/12/2017	0.29	19	1.9	6.4	7.3	0.65	0.28	22
4/11/2018	0.31	16	3	5.8	7.7	0.66	0.31	22
7/23/2019	0.37	14	2.8	5	7.6	0.43	0.19	23

Pollutant	Value	Units
1,1,1-Trichloro-ethane Dry Wt	22	ug/kg
1,1,2,2-Tetrachloro-ethane Dry Wt	24	ug/kg
1,1,2-Trichloro-ethane Dry Wt	22	ug/kg
1,1-Dichloroethane Dry Wt	21	ug/kg
1,2-Dichloropropane Dry Wt	19	ug/kg
1,2-Diphenyl-hydrazine Dry Wt	160	ug/kg
1,2-trans Dichloroethylene Dry Wt	19	ug/kg
1,3-Dichlorobenzene Dry Wt	300	ug/kg
1,3-Dichloropropylene Dry Wt	18	ug/kg
1,4-Dichlorobenzene Dry Wt	270	ug/kg
2,4,6-Trichloro- phenol Dry Wt	130	ug/kg
2,4-Dichlorophenol Dry Wt	140	ug/kg
2,4-Dimethyl- phenol Dry Wt	350	ug/kg
2,4-Dinitro- phenol Dry Wt	160	ug/kg
2,4-Dinitro- toluene Dry Wt	190	ug/kg
2,6-Dinitrotoluene Dry Wt	180	ug/kg

Pollutant	Value	Units
2-Chloroethyl vinyl ether Dry Wt	23	ug/kg
2-Chloronaphthalene Dry Wt	180	ug/kg
2-Chlorophenol Dry Wt	140	ug/kg
2-Nitrophenol Dry Wt	140	ug/kg
3,3'-Dichlorobenzidine Dry Wt	960	ug/kg
4,4'-DDD Dry Wt	3	ug/kg
Acrolein Dry Wt	110	ug/kg
Acrylonitrile Dry Wt	27	ug/kg
Aldrin Dry Wt	2	ug/kg
Anthracene Dry Wt	170	ug/kg
Benzene Dry Wt	22	ug/kg
Benzidine Dry Wt	940	ug/kg
Benzo(a)anthracene Dry Wt	160	ug/kg
Benzo(a)pyrene Dry Wt	200	ug/kg
Benzo(b)fluoranthene Dry Wt	230	ug/kg
Benzo(ghi)perylene Dry Wt	120	ug/kg
Benzo(k)fluoranthene Dry Wt	220	ug/kg
BHC alpha Dry Wt	2	ug/kg
BHC beta Dry Wt	2	ug/kg
BHC delta Dry Wt	31	ug/kg
BHC, gamma (Lindane) Dry Wt	2	ug/kg
Bis(2-Chloroethoxy) methane Dry Wt	130	ug/kg
Bis(2-Chloroethyl)ether Dry Wt	180	ug/kg
Bis(2-Chloroisopropyl) ether Dry Wt	190	ug/kg
Bis(2-Ethylhexyl) phthalate Dry Wt	210	ug/kg
Bromoform Dry Wt	20	ug/kg
Bromomethane Dry Wt	7	ug/kg
Butyl benzyl phthalate Dry Wt	200	ug/kg
Carbon tetrachloride Dry Wt	22	ug/kg
Carbon tetrachloride Dry Wt	22	ug/kg
Chlordane Dry Wt	14	ug/kg
Chlordane Dry Wt	14	ug/kg
Chlorobenzene Dry Wt	22	ug/kg
Chlorodibromo-methane Dry Wt	20	ug/kg
Chloroethane Dry Wt	170	ug/kg
Chloroform Dry Wt	18	ug/kg
Chloromethane Dry Wt	18	ug/kg
Chrysene Dry Wt	170	ug/kg
Dibenzo(a,h)-anthracene Dry Wt	140	ug/kg
Dichlorobromo-methane Dry Wt	16	ug/kg
Dieldrin Dry Wt	2	ug/kg
Diethyl phthalate Dry Wt	180	ug/kg
Dimethyl phthalate Dry Wt	170	ug/kg
Di-n-butyl phthalate Dry Wt	220	ug/kg
Endosulfan alpha Dry Wt	2	ug/kg
Endosulfan beta Dry Wt	1	ug/kg

Pollutant	Value	Units
Endosulfan sulfate Dry Wt	2	ug/kg
Endrin aldehyde Dry Wt	2	ug/kg
Endrin Dry Wt	2	ug/kg
Ethylbenzene Dry Wt	27	ug/kg
Fluoranthene Dry Wt	250	ug/kg
Fluorene Dry Wt	210	ug/kg
Heptachlor Dry Wt	2	ug/kg
Heptachlorepoxide Dry Wt	2	ug/kg
Hexachlorobenzene Dry Wt	210	ug/kg
Hexachlorobutadiene Dry Wt	250	ug/kg
Hexachlorocyclo-pentadiene Dry Wt	90	ug/kg
Hexachloroethane Dry Wt	350	ug/kg
Indeno(1,2,3-cd)-pyrene Dry Wt	120	ug/kg
Isophorone Dry Wt	140	ug/kg
Methylene chloride Dry Wt	19	ug/kg
Naphthalene Dry Wt	200	ug/kg
Nitrobenzene Dry Wt	160	ug/kg
N-Nitrosodimethyl-amine Dry Wt	150	ug/kg
N-Nitrosodi-n-propylamine Dry Wt	130	ug/kg
N-Nitrosodiphenyl-amine Dry Wt	450	ug/kg
P-Chloro-m-Cresol (3-methyl-4-chlorophenol) Dry Wt	150	ug/kg
Pentachloro- phenol Dry Wt	220	ug/kg
Phenanthrene Dry Wt	170	ug/kg
Phenol Dry Wt	140	ug/kg
Pyrene Dry Wt	200	ug/kg
Tetrachloroethylene Dry Wt	20	ug/kg
Toluene Dry Wt	19	ug/kg
Toxaphene Dry Wt	180	ug/kg
Trichloroethylene Dry Wt	29	ug/kg
Vinyl chloride Dry Wt	17	ug/kg
Dioxin, 1,2,3,4,6,7,8-HpCDD Dry Wt	5	ng/kg
Dioxin, 1,2,3,4,7,8-HxCDD Dry Wt	5	ng/kg
Dioxin, 1,2,3,6,7,8-HxCDD Dry Wt	5	ng/kg
Dioxin, 1,2,3,7,8,9-HxCDD Dry Wt	5	ng/kg
Dioxin, 1,2,3,7,8-PeCDD Dry Wt	5	ng/kg
Dioxin, 2,3,7,8-TCDD Dry Wt	1	ng/kg
Dioxin, OCDD Dry Wt	22	ng/kg
Furan, 1,2,3,4,6,7,8-HpCDF Dry Wt	5	ng/kg
Furan, 1,2,3,4,7,8- HxCDF Dry Wt	5	ng/kg
Furan, 1,2,3,4,7,8,9- HpCDF Dry Wt	5	ng/kg
Furan, 1,2,3,6,7,8- HxCDF Dry Wt	5	ng/kg
Furan, 1,2,3,7,8,9- HxCDF Dry Wt	5	ng/kg
Furan, 1,2,3,7,8-PeCDF Dry Wt	5	ng/kg
Furan, 2,3,4,6,7,8- HxCDF Dry Wt	5	ng/kg
Furan, 2,3,4,7,8-PeCDF Dry Wt	5	ng/kg

Pollutant	Value	Units
Furan, 2,3,7,8-TCDF Dry Wt	1	ng/kg
Furan, OCDF Dry Wt	10	ng/kg
PCB 1016 Dry Wt	20	mg/kg
PCB 1221 Dry Wt	42	mg/kg
PCB 1232 Dry Wt	21	mg/kg
PCB 1242 Dry Wt	19	mg/kg
PCB 1248 Dry Wt	10	mg/kg
PCB 1254 Dry Wt	15	mg/kg
PCB 1260 Dry Wt	19	mg/kg
PCB Total Dry Wt	20	mg/kg
Aluminum Dry Wt	5000	mg/kg
Antimony Dry Wt	5	mg/kg
Arsenic Dry Wt	3	mg/kg
Barium, Total Recoverable	79	mg/kg
Beryllium Dry Wt	0	mg/kg
Boron Dry Wt	56	mg/kg
Calcium Dry Wt	100000	mg/kg
Chloride	190	mg/kg
Cyanide Dry Wt	0	mg/kg
Fluoride	2	mg/kg
Iron Dry Wt	4600	mg/kg
Magnesium Dry Wt	2800	mg/kg
Manganese Dry Wt	310	mg/kg
Mercury Dry Wt	0	mg/kg
Molybdenum Dry Wt	2	mg/kg
Nitrogen, Nitrite + Nitrate Total	0	Percent
Selenium Dry Wt	8	mg/kg
Silver Dry Wt	1	mg/kg
Sodium Dry Wt	2800	mg/kg
Strontium	71	mg/kg
Sulfate, Total	1500	mg/kg
Thallium Dry Wt	2	mg/kg



APPENDIX B

DERIVATION OF TECHNOLOGY-BASED EFFLUENT LIMITATIONS FOR BOD_5 AND TSS

Technology-based Effluent Limits from s. NR 284.12, Wis. Adm. Code

Subcategory	BOD_5 (lbs BOD_5 per ton of production)		TSS (lbs TSS per ton of production)	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum
Papergrade sulfite (drum wash)	31.0	59.5	47.3	87.9
Papergrade sulfite (blow pit wash)	33.1	63.6	47.3	87.9
Nonintegrated fine paper	8.5	16.4	11.8	22.0

Current and Proposed Effluent Limits:

Current technology-based effluent limits for BOD_5 and TSS are derived from production rates of 484.4 TPD of fine paper and 198.5 TPD of calcium-based sulfite pulp (blow pit wash). Domtar demonstrated this production prior to 1985.

BOD_5:

- $Monthly\ Avg = \left\{198.5\frac{tons}{day} x\ 33.1\frac{lbs\ BOD5}{ton}\right\} + \left\{\left(484.4\frac{tons}{day} - 198.5\frac{tons}{day}\right) x\ 8.5\frac{lbs\ BOD5}{ton}\right\} = 9{,}000\frac{lbs\ BOD5}{day}$
- $Daily\ Maximum = \left\{198.5\frac{tons}{day} x\ 63.6\frac{lbs\ BOD5}{ton}\right\} + \left\{\left(484.4\frac{tons}{day} - 198.5\frac{tons}{day}\right) x\ 16.4\frac{lbs\ BOD5}{ton}\right\} = 17{,}314\ \frac{lbs\ BOD5}{day}$

TSS:

- $Monthly\ Avg = \left\{198.5\frac{tons}{day} x\ 47.3\frac{lbs\ TSS}{ton}\right\} + \left\{\left(484.4\frac{tons}{day} - 198.5\frac{tons}{day}\right) x\ 11.8\frac{lbs\ TSS}{ton}\right\} = 12{,}763\frac{lbs\ TSS}{day}$
- $Daily\ Maximum = \left\{198.5\frac{tons}{day} x\ 87.9\frac{lbs\ TSS}{ton}\right\} + \left\{\left(484.4\frac{tons}{day} - 198.5\frac{tons}{day}\right) x\ 22.0\frac{lbs\ TSS}{ton}\right\} = 23{,}738\ \frac{lbs\ TSS}{day}$

Effluent Limits Based on Current Production:

In correspondence with DRM, they reported their production rate as 434 TPD of fine paper (2016 – 2019 average) and 180 TPD of calcium-based sulfite pulp (drum wash, 2016 – 2019 average). DRM also purchases an average of 96 TPD (2016 – 2019 average) of kraft pulp, which is combined with the produced pulp, to make the fine paper. See data below for more information.

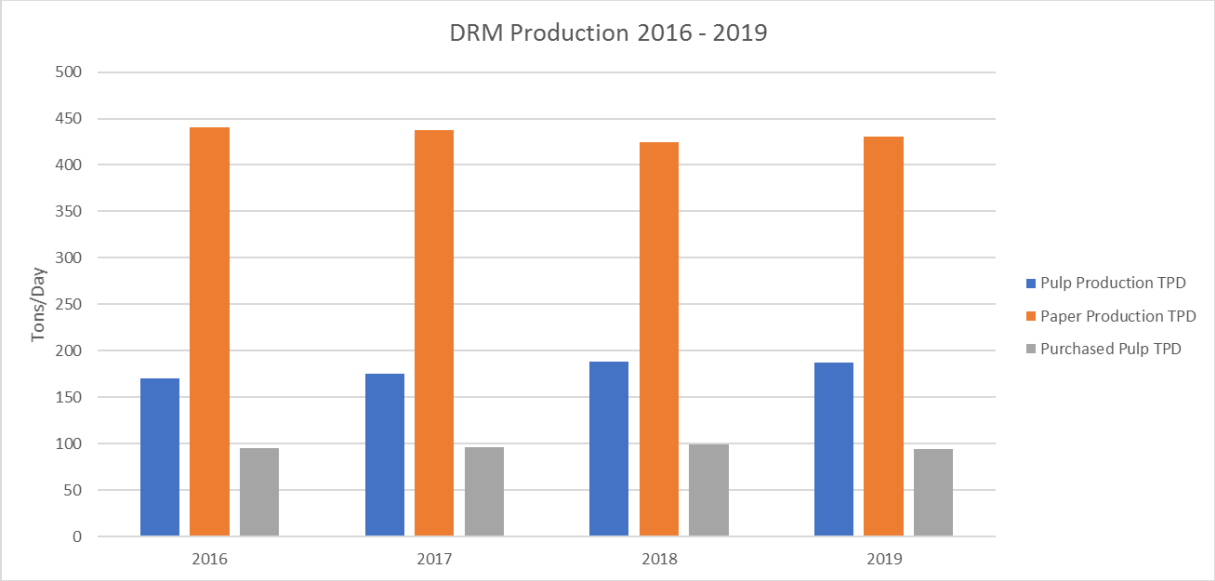
BOD_5:

- $Monthly\ Avg = \left\{180\frac{tons}{day}\ x\ 31.0\frac{lbs\ BOD5}{ton}\right\} + \left\{\left(434\frac{tons}{day} - 180\frac{tons}{day}\right)x\ 8.5\frac{lbs\ BOD5}{ton}\right\} = 7{,}739\frac{lbs\ BOD5}{day}$
- $Daily\ Maximum = \left\{180\frac{tons}{day}x\ 59.5\frac{lbs\ BOD5}{ton}\right\} + \left\{\left(434\frac{tons}{day} - 180\frac{tons}{day}\right)x\ 16.4\frac{lbs\ BOD5}{ton}\right\} = 14{,}876\ \frac{lbs\ BOD5}{day}$

TSS:

- $Monthly\ Avg = \left\{180\frac{tons}{day}x\ 47.3\frac{lbs\ TSS}{ton}\right\} + \left\{\left(434\frac{tons}{day} - 180\frac{tons}{day}\right)x\ 11.8\frac{lbs\ TSS}{ton}\right\} = 11{,}511\frac{lbs\ TSS}{day}$
- $Daily\ Maximum = \left\{180\frac{tons}{day}x\ 87.9\frac{lbs\ TSS}{ton}\right\} + \left\{\left(434\frac{tons}{day} - 180\frac{tons}{day}\right)x\ 22.0\frac{lbs\ TSS}{ton}\right\} = 21{,}410\ \frac{lbs\ TSS}{day}$

Because the effluent limits derived based on current production are more stringent than the limits based on production before 1985, the reissued WPDES permit will use the limits based on current production.



	2016			2017			2018			2019		
	Operating days	Gross Tons	TPD Avg	Operating days	Gross Tons	TPD Avg	Operating days	Gross Tons	TPD Avg	Operating days	Gross Tons	TPD Avg
Pulp Production	355	60180	170	355	61985	175	360	67544	188	356	66676	187
Paper Production	337	148689	441	335	146886	438	363	153827	424	345	148832	431

APPENDIX C

CWIS BTA DETERMINATION

Executive Summary

Section 316(b) of the Clean Water Act requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. The department has made a Best Technology Available (BTA) determination for one cooling water intake structure (CWIS) located at DRM in accordance with ch. NR 111, Wis. Adm. Code, and 40 CFR §125.90-98. The BTA for the CWIS is based the required information submitted for a facility that withdraws greater than 2 MGD Design Intake Flow (DIF) and less than or equal to 125 MGD Actual Intake Flow (AIF) and uses greater than 25% for cooling. DRM is considered an existing facility for purposes of the rule because construction of the facility commenced prior to January 17, 2002 (s. NR 111.02(3)(a), Wis. Adm. Code). The department has concluded that CWIS at DRM is the best technology available for minimizing adverse environmental impact.

The unique location of the CWIS meets the impingement mortality standard of s. NR 111.12, Wis. Adm. Code, and 40 CFR §125.94(c)(11), de minimis rate of impingement, due to the impingement rate being so low that additional impingement controls are not necessary. The department has determined that no additional requirements of 40 CFR §125.94(c)(8), (c)(9) or (g) are required.

The department must establish BTA standards for entrainment reduction for each intake on a site-specific basis (s. NR 111.13, Wis. Adm. Code, and 40 CFR §125.94(d)). "The entrainment requirements must reflect the Director's determination of the maximum reduction in entrainment warranted after consideration of factors relevant for determining the best technology available for minimizing adverse environmental impact at each facility" (40 CFR §125.98(f)). After consideration of the factors specified in 40 CFR §125.98(f)(2) and (f)(3), the department has concluded that the CWIS is considered the best technology available to achieve the maximum reduction in entrainment.

The BTA determination will be reviewed at the next permit reissuance and at subsequent reissuances in accordance with 40 CFR §125.90-98 and ch. NR 111, Wis. Adm. Code, as applicable. In subsequent permit reissuance applications, the permittee shall provide all the information required in 40 CFR §122.21(r) and s. NR 111.40, Wis. Adm. Code, unless a request to reduce the information required has been submitted by the permittee and accepted by the department, as allowed by 40 CFR §125.95(c).

Intake Description:

AIF = 11.269 MGD

DRM also takes in 0.231 MGD from Well #53602 (Parking Lot Well) and 0.893 MGD from Well #17551 (Cooling Well).

DIF = 43.2 MGD
Source Water: Upper Wisconsin River

S. NR 111.03(2)(c), Wis. Adm. Code, and 40 CFR §125.91(a)(3) specify that the requirements of ch. NR 111, Wis. Adm. Code and 40 CFR Part 125 Subpart J apply to those facilities where the percentage of cooling on an actual intake flow basis is greater than or equal to 25%. Basing this determination on a strictly actual intake flow basis (average of 2015 – 2019), the percentage of water used exclusively for cooling purposes at DRM is 27.5%.

The intake was constructed at the same time the facility was, in 1909.

DRM operates a dam that utilizes seven turbines to generate hydroelectricity. Each turbine is located in a separate turbine pit, and each turbine pit has a rectangular intake with a head gate and trash rack on the upstream side of the pit. At the time of permit issuance, turbines #1 and #7 were not operable. Trash screens are constructed of bars on 1 and 3/8 inch centers. DRM generates as much hydroelectricity as possible. Unless river flows are high, the entire river flow passes through the hydro plant. River water will pass over the dam's spillway only during high river flows. DRM utilizes three intake pumps to supply process and cooling water – these intake pumps withdraw water from within turbine pits 3, 4, and 5.

The continuously-operated intake structure consists of 3 variable-speed pumps, which each have a 32" diameter pipe covered by a 1"-thick mesh screen with 2.5" spacings. The pipes extend vertically, approximately 7' below the water level. Each pipe is contained in its own turbine pit (turbine pits 3, 4, and 5), and each turbine pit is approximately 20' wide (~60' total), with a constant water depth of 16'. Each turbine pit is covered by a bar screen with 1.375"-openings.

This intake pipe is the point of compliance for impingement Best Technology Available (BTA) requirements. The point of compliance is set at the point at which waters of the state are withdrawn. The *National Wildlife Federation vs. Gorsuch* decision states that water passing through a dam does not constitute a discharge in the NPDES system. Therefore, it remains waters of the state as it passes through the dam. As a result, the point of withdrawal is inside the dam's turbine pits.

Location: The intake structure is located at 44° 53′ 30.67″ N, 89° 37′ 33.18″ W.

O&M: The intake structure screen is manually cleaned using a rake on a daily basis.

Max Design Through-Screen Velocity Calculation:

Velocity = DIF / [Total Screen Area (3.14159 * 1.333ft^2 * 3 screens) – Closed Screen Area (4.70 ft^2)]

$$\text{Velocity} = \frac{43{,}200{,}000\ \text{gal}}{1\ \text{day}} * \frac{1\ \text{ft}^3}{7.48\ \text{gal}} * \frac{1}{(16.8\ \text{ft}^2 - 4.7\ \text{ft}^2)} * \frac{1\ \text{day}}{86{,}400\ \text{s}} = 5.5\ \text{ft/s}$$

Average Through-Screen Velocity Calculation:

Velocity = AIF / [Total Screen Area (3.14159 * 1.333ft^2 * 3 screens) – Closed Screen Area (4.70 ft^2)]

$$\text{Velocity} = \frac{11{,}269{,}000\ \text{gal}}{1\ \text{day}} * \frac{1\ \text{ft}^3}{7.48\ \text{gal}} * \frac{1}{(16.8\ \text{ft}^2 - 4.7\ \text{ft}^2)} * \frac{1\ \text{day}}{86{,}400\ \text{s}} = 1.4\ \text{ft/s}$$

Cross-Flow Velocity Calculation (Using Mean Harmonic Flow):

Velocity = Mean Harmonic Flow of WI River / Total area of five turbine pits

$$\text{Velocity} = \frac{1{,}921{,}000{,}000 \text{ gal}}{1 \text{ day}} * \frac{1 \text{ ft}^3}{7.48 \text{ gal}} * \frac{1}{(16 \text{ ft of water} * 20 \text{ ft width} * 5 \text{ intakes})} * \frac{1 \text{ day}}{86{,}400 \text{ s}} = 1.9 \text{ ft/s}$$

§122.21(r) Application Materials Submitted

As part of the WPDES Permit Application, DRM was required to submit information required under 40 CFR §122.21(r)(2) through (8). Based on a review of the flow monitoring data submitted to the department on the Discharge Monitoring Reports during the current permit term, DRM's Actual Intake Flow (AIF) is below 125 MGD. Because the AIF is not greater than 125 MGD the permittee was not required to submit information required under 40 CFR §122.21(r)(9) through (13).

As part of the Application for WPDES Permit Reissuance, DRM provided the information required under 40 CFR §122.21(r)(2) through (8). All of the relevant application materials were included in a report titled "Domtar Company LLC Rothschild Mill 40 CFR § 122.21(r) Review and Entrainment BTA Alternatives Analysis" dated 03/30/2020.

In accordance with 40 CFR §125.94(a), DRM is subject to the best technology available (BTA) standards for impingement mortality reduction under 40 CFR §125.94(c) and entrainment mortality reduction under 40 CFR §125.94(d), including any measures to protect federally-listed threatened and endangered species and designated critical habitat established under 40 CFR §125.94(g). A discussion on the BTA standards for impingement mortality is discussed first followed by entrainment.

BTA Standards for Impingement Mortality

In accordance with 40 CFR §125.94(c), DRM must comply with one of the alternatives in paragraphs (c)(1) through (7) of this section, except as provided in paragraphs (c)(11) or (12) of this section, when approved by the Director. In addition, a facility may also be subject to the requirements of paragraphs (c)(8), (c)(9), or (g) of this section if the Director requires such additional measures.

The permittee proposes to be exempted from the requirement to install an impingement mortality BTA as allowed under 40 CFR §125.94(c)(11), de minimis rate of impingement. The department has evaluated this proposal under 40 CFR §125.94(c). The department has determined that no additional requirements of 40 CFR §125.94(c)(8), (c)(9) or (g) are needed.

Given the location of the existing intakes within the hydroelectric project and difficulties of safely sampling for impingement in an active penstock, an alternate approach to impingement sampling was utilized. The size of the organisms collected during the entrainment characterization study were evaluated and used as a surrogate for an impingement mortality study. Fish retained on a sieve with mesh size of 0.56 inches were counted toward impingement mortality and used to evaluate impingement at the cooling water intake structure. None of the individuals collected in the entrainment samples were characterized as impingeable-sized fish. The limiting dimension (maximum width/depth) of the largest individual collected in the entrainment samples was 7.7 mm, which was small enough in width/depth to fit through a 14.224 mm opening. With no impingeable-sized fish collected during the sampling periods, along with the fact that the cross-sectional sweeping velocity over the trash rack is greater than the intake velocity, the department tentatively agrees that this technology meets the de minimis rate of impingement mortality. Tim Parks, DNR Fisheries Biologist, noted the following: "the low sample size of individuals collected and the low resolution sampling frequency during June and July introduces a lot of uncertainty regarding the density and extrapolated abundances of fish in these specific months…High frequency sampling during June and July could provide you with a more accurate and precise estimate." Because this was determined based on a limited sampling set, the department is requiring more robust sampling during the next permit term to confirm these impingement numbers.

BTA Standards for Entrainment

The permittee proposes that the design and operation of the recently modified intakes meets the BTA standards for entrainment mortality reduction. The department has evaluated this proposal under 40 CFR §125.94(d) and the relevant factors in 40 CFR §125.98 and recommends the approval of this proposal. Below is a written explanation of the proposed entrainment determination as required by 40 CFR §125.98(f)(1).

For entrainment control, the regulations expressly call for the permitting agency to make a site-specific determination of which technologies and/or practices satisfy the BTA standard for each individual facility (40 CFR 125.94(d)). The BTA "must reflect the Director's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in 40 CFR §125.98." 40 CFR §125.95(d). The regulations also give permitting authorities the discretion to "reject an otherwise available technology" as the BTA for entrainment if the social costs are "not justified" by the social benefits or if there are other unacceptable adverse factors that cannot be mitigated (40 CFR §125.98(f)(4)).

The proposed determination must be based on consideration of any additional information required by the Director and the factors listed in 40 CFR §125.98(f)(2). The weight given to each factor is within the Director's discretion based upon the circumstances of each facility. In addition, the proposed determination may be based on consideration of the factors listed in 40 CFR §125.98(f)(3).

In accordance with 40 CFR §125.98(f)(2), the following factors *must* be considered:

> (i) numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);
>
> (ii) impact of changes in particulate emissions or other pollutants associated with entrainment technologies;
>
> (iii) land availability inasmuch as it relates to the feasibility of entrainment technology;
>
> (iv) remaining useful plant life; and
>
> (v) quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

In accordance with 40 CFR §125.98(f)(3), the following factors *may* be considered in determining a site-specific BTA:

> (i) entrainment impacts on the waterbody;
>
> (ii) thermal discharge impacts;
>
> (iii) credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014;
>
> (iv) impacts on the reliability of energy delivery within the immediate area;
>
> (v) impacts on water consumption; and
>
> (vi) availability of process water, gray water, wastewater, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

In the preamble to the 316(b) Rule (79 Fed. Reg. 48300 at 48303), USEPA indicated the following:

> The entrainment provision reflects EPA's assessment that there is no single technology basis that is BTA for entrainment at existing facilities, but instead a number of factors that are best

accounted for on a site-specific basis. Site-specific decision making may lead to a determination by the NPDES permitting authority that entrainment requirements should be based on variable speed pumps, water reuse, fine mesh screens, a closed-cycle recirculating system, or some combination of technologies that constitutes BTA for the individual site. The site-specific decision-making may also lead to no additional technologies being required.

Candidate entrainment control technologies are provided in 40 CFR §122.21(r)(10), including a closed cycle recirculation system, fine mesh screens with a mesh size of 2 mm or smaller, and water reuse or alternate sources of cooling water. In addition, variable speed pumps (i.e., variable frequency drive pumps) are another technology to consider. DRM has variable speed pumps already installed, in addition to increasing water reuse over the past four years with the installation of a Non-Contact Cooling Water Reuse System.

Entrainment Performance Evaluation

The discussion that follows combines 40 CFR 125.98(f)(2)(i) with (f)(3)(i), because there is overlap in the two factors.

> FACTOR (f)(2)(i) Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base)
>
> FACTOR (f)(3)(i) Entrainment impacts on the waterbody

An entrainment study conducted in 2019 evaluated these impacts.

Field samples were collected in accordance with a monitoring plan that was prepared by Normandeau Associates, Inc., submitted to the department by DRM on January 14, 2019. Samples were collected on one day per month during the months of May, June, July, August, September, October, and November 2019. Sampling was not conducted in winter months (December-April) because department fisheries biologists did not believe that native species would be present in egg/larvae (i.e. entrainable size) life stages during those months. Samples were collected during the nighttime and daytime hours to account for diurnal variations, yielding a total of 14 samples.

Entrainment samples were collected from turbine pit #4 which is located behind the trash rack and in front of a river water pump pipe suction line that supplies cooling and process water to the Mill. Samples were collected continuously with a 3-inch electric pump equipped with a recessed impellor.

The pump was used to withdraw a minimum of 100 m^3 of water from the sampling point through a 3-inch diameter pipe positioned vertically in the water column with a 90-degree elbow (sampling inlet) facing into the intake flow at the sample point. The sampling inlet was positioned in the water column at approximately the same elevation as the river water pump suction intake line. For more information on the sampling techniques that were utilized, please see DRM's 2020 Entrainment Characterization Report.

No threatened or endangered species were collected in any of the samples. There seemed to be no impact on designated critical habitat (e.g., prey base) due to lack of threatened or endangered species in the source waterbody that would depend upon such critical habitat. Entrained organisms were only encountered during the months of June and July.

Based on the density of the organisms and the actual intake flow rates, the total number of organisms entrained by the fine mesh screen in 2019 were estimated to be 18,950 during June and 141,899 during July (Table 1). When compared to the annual estimates of entrainable organisms in the Wisconsin River, the variable speed pumps result in a 74% reduction in the number of entrained organisms when compared to if variable speed pumps were not in use. Tim Parks, DNR Fisheries Biologist, though hesitant to draw definitive conclusions based on the limited sample set, indicated that stocking is not currently necessary

for any of the species that were entrained in DRM's sampling efforts. Additionally, fish populations in this area already have naturally high mortalities at young ages. Once more data is available for the next permit reissuance, the department will be able to fully assess the impact that DRM's intake is having on the local fisheries, but the data that is available now does not seem to indicate that the intake is affecting local fish populations significantly.

Table 1: Abundance of ichthyoplankton entrained at average intake flows by month, taxonomic group, and life stage at DRM, May to November 2019

		Abundance (Total Fish)						
		May	June	July	August	September	October	November
Fish Taxon	**Life Stage**							
Walleye	**post yolk-sac larvae**	0	12,494	0	0	0	0	0
Yellow Perch	**post yolk-sac larvae**	0	6,455	0	0	0	0	0
Channel Catfish	**yolk-sac larvae**	0	0	64,594	0	0	0	0
Crappie spp.	**yolk-sac larvae**	0	0	12,919	0	0	0	0
Yellow Bullhead	**yolk-sac larvae**	0	0	58,135	0	0	0	0
Osteichthyes	**Unidentified**	0	0	6,251	0	0	0	0
Total		0	18,950	141,899	0	0	0	0

Table 2: Annual Estimates of Entrainable Organisms in the Wisconsin River Compared with Results from DRM's 2019 Entrainment Characterization Study

	MAY	JUN	JUL	AUG	SEP	OCT	NOV	TOTAL
Total Density from 2019 Domtar Entrainment Characterization Study (No./100 m^3)	0	1.46	10.75	0	0	0	0	-
Number of Entrainable Organisms in Area of Intake (based on 674 MGD, the $Q_{7,10}$ of Wisconsin River)	0	1,133,381	8,487,002	0	0	0	0	9,620,383
Number of Entrained Organisms (based on DIF of 43.2 MGD)	0	72,644	543,974	0	0	0	0	616,618

Number of Entrained Organisms (based on AIF of 11.269 MGD)	0	18,950	141,899	0	0	0	0	160,849

Current Technologies Utilized

DRM currently utilizes two entrainment control technologies: variable-frequency drive (VFD) pumps, and a cooling water recovery system (CWRS), which has had the effect of reducing the amount of water withdrawn for cooling.

Implementation of DRM's CWRS has resulted in the reuse of hundreds of millions of gallons of water that was previously used exclusively for cooling (Table 3).

Table 3: Water Recycling by Month, 2018 – 2019*

2018	MG (month)	2019	MG (month)
January	127.086009	January	127.22822
February	118.931504	February	115.83801
March	139.099817	March	129.86185
April	111.252609	April	88.86952
May	3.376667	May	16.17046
October	90.217358	October	56.30876
November	130.172074	November	117.72232
December	125.999806		123.29269

*June, July, August, and September had no water recycling

Evaluation of Other Candidate Entrainment Control Technologies

Since DRM currently utilizes VFD pumps and has recently installed a non-contact cooling water recovery system, the department evaluated the other remaining candidate entrainment control technology in order to make the BTA determination. Below is an evaluation of the technology:

1. TECHNOLOGY: Natural Draft and Mechanical Draft Cooling Towers (closed-cycle recirculating system)

> 1.1. FACTOR (f)(2)(i) Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

A closed cycle system would potentially reduce entrainment. This is because entrainment reductions are directly proportional to flow reductions. As discussed in the 316(b) Rule Preamble, mechanical draft cooling towers operating in freshwater sources can achieve flow reductions of 97.5 percent (based on a cycle of concentration of 3.0). 79 Fed. Reg. 48300 at 48338. Therefore, USEPA estimates that

freshwater cooling towers, compared to once-through cooling systems, reduce impingement mortality and entrainment by 97.5 percent.[1] To compare, the current CWIS has achieved a 74% reduction in entrainment based on the continued use of VFDs.

Natural draft cooling towers are large concrete towers often associated with power generating stations. These structures use large flows of water through the towers to create differential pressure between the tower interior and exterior, inducing a natural draft through the tower, and exhausting at the top the tower as a warm vapor plume. These systems require a large footprint and large cooling water flow to operate. It's estimated that a natural draft tower processing 300-MGD of cooling water flow requires approximately 300-ft in diameter and 500-ft tall. Given the much smaller total facility intake of DRM, and the use of the majority of the water taken in for process purposes, the cooling water flow is much too low to render natural draft cooling towers as a viable technology.

The Rothschild Biomass Cogeneration Plant, constructed in 2010 adjacent to the Mill along the Wisconsin River, utilizes a mechanical draft cooling tower for cooling water from the condenser from that facility. The maximum discharge from the facility, noted in the 2010 Environmental Analysis prepared by the department, was 0.547 MGD.

To accommodate the design intake flow, a cooling tower would be sized for 40 to 50-MGD, which includes spare capacity in case a fan cell needed to be taken off-line for maintenance. Using information provided by the Georgia Pacific Broadway mill, a tower system with capacity for the design intake flow would consist of four fan cells with a total footprint of 150-ft x 45-ft and 400-hp of fan loading, in order to achieve a heat removal rate of 3-GPM/ton and accommodate a cooling range of 10-degrees and a heat removal rate of 3-GPM/ton. A new 800-hp pump station would be required to return the full flow of cooled water from the cooling tower wet well back to the condenser, and the existing river water pumps could be converted to pump cooling water from the condensers to the cooling tower. To accommodate the current peak summer cooling load with spare capacity for maintenance (10 MGD), it would effectively require an installation roughly 25% of these numbers.

Makeup water is typically approximately 1% of the total recirculating flow. If the facility only used intake water for cooling, the expected reduction in flow through the intake system would potentially be in the range of 98-99%. However, the majority of water withdraw through the intake is used for process water. In addition, the Mill reuses up to 4.5 MGD of non-contact cooling water for process water. Installation of a cooling tower would remove this raw water source, and another source would be required. In absence of another source, the compensation would be with river water, which would offset the reduction in water usage from utilizing a closed cycle cooling system (i.e., the significant reduction of withdrawn water). The adjusted reduction in flow associated with installation of cooling water would be less than the goal of a 95% reduction from utilization of this technology. 79 *Fed. Reg*. 48,300, 48,338 (Aug. 15, 2014).

1.2. FACTOR (f)(2)(ii) Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

Installation of a mechanical draft cooling tower would result in increased air emissions, and a new emission source. While any tower would likely utilize plume abatement technology, the tower

[1] USEPA. *Technical Development Document for the Final Section 316(b) Existing Facilities Rule*. EPA-821-R-14-002. May 2014.

associated with visibility reduction due to fogging, ice formation on surfaces downwind from the cells, and visual pollution as perceived by receptors adjacent to the Mill and within the Mill's viewshed.

It is expected that the parasitic load created by the addition of the tower fans and pump station would increase the load on the Mill electric generators, thus increasing fuel consumption and associated increase in gas combustion emissions associated with increased output. With 400-HP of fan load and 800-HP of pumping loads (without an associated decrease in other system loads), the parasitic load is expected to be equivalent to approximately 1-megawatt, which is equal to approximately 1.3% of the Mill's nameplate generating capacity.

1.3. FACTOR (f)(2)(iii) Land availability inasmuch as it relates to the feasibility of entrainment technology.

The projected size of a 4x1 MDCT bank is 150-ft x 45-ft. Adding some space for an adjacent pump station, there is available land of the site for the installation of a system of this size.

1.4. FACTOR (f)(2)(iv) Remaining useful plant life.

As there are no plans to terminate operation of the Mill, remaining useful life of the Mill is not a consideration in the efficacy of CCRS.

1.5. FACTOR (f)(2)(v) Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

This factor is highly dependent on intake flow. This factor is not used because information on benefits and costs is not of sufficient rigor to make a decision.

The permittee is not required to provide Cost Evaluation Study (40 CFR §122.21(r)(10)) or Benefits Evaluation (40 CFR §122.21(r)(11)) because AIF is less than 125 MGD.

1.6. FACTOR (f)(3)(i) Entrainment impacts on the waterbody.

These were discussed and considered in the section titled *Entrainment Performance Evaluation* above.

1.7. FACTOR (f)(3)(ii) Thermal discharge impacts.

The cooling tower would reduce thermal discharge impacts. However, the facility has been in compliance with applicable effluent temperature limitations which are protective of surface water quality. The department does not consider this a significant factor.

1.8. Summary/Conclusion.

Both a Natural Draft Cooling Tower and a Mechanical Draft Cooling Tower would potentially reduce entrainment due to decreased flows. However, other unacceptable adverse factors that cannot be mitigated make this technology unavailable at DRM. The most unacceptable adverse factor is the fact that any amount of decreased flow for cooling water would be offset by an increase in the amount of river water required for process wastewater. Additional factors contribute to making this technology infeasible, including:

- Larger footprint required (for natural draft cooling tower)
- Increase in particulate emissions (which would likely require a minor source air permit), increased energy usage, and increased chemical usage

For all of these reasons, the department has rejected additional natural draft and mechanical draft cooling towers as options for DRM.

Entrainment BTA Decision

Natural Draft and Mechanical Draft Cooling Towers were rejected as options for DRM primarily due to the lack of a perceived benefit in terms of flow reductions (and subsequent entrainment reductions). A 2mm fine screen option was not considered in this evaluation because it is expected that all entrainable organisms excluded would be killed on the screens.

When compared with the installation of a ND and/or MD cooling tower, the VFDs, as noted above, have achieved a 74% reduction in entrainment. While this is less than the estimated 97.5% reduction noted above, other important factors such as land use, increase in emissions, and increased energy usage make the cooling towers non-viable options. Additionally, the actual amount of water withdrawn from the river would likely not decrease due to the additional amount of process wastewater that would need to be withdrawn as a result, thus likely not achieving the 97.5% reduction number.

It is also important to note that the CWRS is estimated to have had a minimal impact on entrainment reduction to date, as no water has been recycled during June or July.

After consideration of the factors specified in 40 CFR §125.98(f)(2) and (f)(3), the department has concluded that DRM's utilization of VFD pumps and continued optimization of a cooling water recovery system are considered the best technology available to achieve the maximum reduction in entrainment at DRM. As DRM continues to optimize the CWRS, more water reuse is expected, and by the next permit reissuance, the department will have a better understanding of the full reuse potential of this system. Additionally, the department is requiring that DRM document the success of the CWRS each year during the permit term, as this will allow DRM to optimize the system and give the department the opportunity to review the data and comment on the progress being made.

Future BTA

Given the uncertainty around the entrainment density numbers which were obtained, DRM is required to perform weekly entrainment and impingement monitoring during June and July of one year during the next permit term to verify that these entrainment densities and assumptions are accurate. These numbers would also support department BTA determinations in future permit reissuances.

Summary

1. The department has made a Best Technology Available (BTA) determination for two cooling water intake structures (CWIS) located at Domtar Rothschild Mill (DRM) in accordance with 40 CFR §125.90-98. The department has concluded that the existing CWIS is the best technology available for minimizing adverse environmental impact.

2. The permittee proposes 40 CFR §125.94(c)(11), de minimis impingement rate, as the BTA standard for impingement mortality for its CWIS. The department has evaluated this proposal under 40 CFR §125.94(c) and recommends the approval of this proposal. The department has

determined that no additional requirements of 40 CFR §125.94(c)(8), (c)(9) or (g) are needed. Additional monitoring with a weekly frequency will be required during June and July in order to validate this conclusion for the next permit term.

3. After consideration of the factors listed in 40 CFR §125.98(f)(2) and (f)(3), the department has concluded that existing CWIS, utilizing a cooling water recovery system and VFDs, is considered the best technology available to achieve the maximum reduction in entrainment.

4. BTA determinations will be reviewed at the next reissuance and at subsequent reissuances in accordance with 40 CFR §125.90-98 and ch. NR 111, Wis. Adm. Code. In subsequent permit reissuance applications, the permittee shall provide all the information required in 40 CFR §122.21(r), unless a request to reduce the information required has been submitted by the permittee and accepted by the department, as allowed by 40 CFR §125.95(c).

5. The BTA includes requirements for monitoring and inspection of the two CWIS and other requirements and terms; please see the permit.

APPENDIX D

SUBSTANTIAL COMPLIANCE DETERMINATION

Permittee Name: Domtar Paper Co LLC		Permit Number: 0026042-08-0
	Compliance?	Comments
Discharge Limits	Yes	No limit exceedances reported during previous permit term.
Sampling/testing requirements	Yes	
Groundwater standards	NA	
Reporting requirements	Yes	There have been a few spill events during the previous permit term. The permittee complied with the reporting requirements and took appropriate mitigative action.
Compliance schedules	Yes	
Management plan	Yes	
Other:	NA	
Enforcement Considerations	NA	
In substantial compliance?	Yes Comments: Signature: Nicholas Lindstrom Date: 10/26/2020 Concurrence: Nate Willis Date: 02/04/2021	

APPENDIX E

WATER QUALITY-BASED EFFLUENT LIMITATION MEMO

DATE: October 5, 2020

TO: Nate Willis – WY/3

FROM: Wade Strickland – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Domtar Paper Co LLC – Rothschild WPDES Permit No. WI-0026042-09-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using Chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Domtar Paper Co LLC – Rothschild in Marathon County. This facility discharges to the Wisconsin River, located in the Lake Du Bay-Wisconsin River Watershed in the Upper Wisconsin River Basin. This discharge is included in the Wisconsin River TMDL as approved by EPA. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis:

Outfall 010 – WWTP Effluent

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1
BOD_5						1
TSS						1
pH	11.0 s.u.	4.0 s.u.				2
Temperature						1
Phosphorus						1
Mercury				9.3 ng/L 400 g/day		1
Chronic WET						3, 5
Acute WET						4, 5

Outfalls 011, 012, and 013 (Emergency Overflow Discharges)

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1
pH	9.0 s.u.	5.0 s.u.				
BOD_5						1
TSS						1
Phosphorus						1

Outfall 014 (010 and the Emergency Outfalls Combined)

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1
BOD_5	17,314 lbs/day			9,000 lbs/day		6, 7
TSS	23,738 lbs/day			12,763 lbs/day		6
Phosphorus				33 lbs/day	0.42 mg/L	8

Outfall 015 – Noncontact cooling water

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1
Temperature						1
Chlorine	38 µg/L			**38 µg/L**		9

Footnotes:

1. Monitoring only.
2. The permittee shall maintain the pH of the discharge within the range of 5.0 to 9.0 standard units (s.u.) except excursions are permitted subject to the following conditions:
   - The pH is monitored continuously;
   - The total time during which the pH is outside the range of 5.0 to 9.0 s.u. shall not exceed 446 minutes in any calendar month;
   - No individual pH excursion outside the range of 5.0 to 9.0 s.u. shall exceed 60 minutes in duration;
   - No individual pH excursion shall be outside the range of 4.0 to 11.0 s.u.; and
   - For each day, the permittee shall report instantaneous maximum pH, instantaneous minimum pH, total time (minutes) that the pH is outside the range of 5.0 to 9.0 s.u. and the number of pH excursions outside the range of 5.0 to 9.0 that exceed 60 minutes in duration.
3. Annual acute WET testing is recommended. The Acute Mixing Zone (AMZ) to assess acute test results is 18%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests.
4. Annual chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 3%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1% and the dilution water used in WET tests conducted on Outfall 010 shall be a grab sample collected from the receiving water, upstream and out of the influence of any discharge.
5. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).
6. The listed limits in the table are categorical limits that are not re-evaluated in this memo.
7. Additionally, tables of daily mass BOD_5 limits for May through October should be continued in the permit in accordance with Table 4-m of ch. NR 212, Wis. Adm. Code. The permit will require daily river flow rate and temperature monitoring to determine the applicable WLA for each day.

8. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 2020.
9. An additional limit to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) is included in bold.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Rachel Fritz at Rachel.Fritz@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table & Map

PREPARED BY: _____ Date: _____
Rachel Fritz,
Water Resources Engineer

E-cc: Nick Lindstrom, Wastewater Engineer – WCR/Eau Claire
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, Environmental Toxicologist – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Domtar Paper Co LLC

WPDES Permit No. WI-0026042-09-0

Prepared by: Rachel Fritz

PART 1 – BACKGROUND INFORMATION

Facility Description:
Domtar Paper Co LLC produces 292 tons per day of calcium-based sulfite pulp from hardwood and 445 tons per day of fine paper at its Rothschild mill (chlorine-free). Pulp and paper production at Domtar's Rothschild mill generates process wastewaters and cooling waters. Domtar also sends its spent pulping liquor (red liquor) to the adjoining LignoTech facility, a chemical recovery plant that manufactures lignosulfate products. Domtar collects and treats LignoTech's red liquor evaporator condensate and other process wastewaters. LignoTech is authorized to discharge noncontact cooling water and process wastewaters under their own permit (WI-0003450). Domtar also treats leachate from the Marathon County, Midstates, Spickler, and Cleveland landfills and process wastewaters from the Wisconsin Electric Power Company's cogeneration biomass facility.

Domtar's wastewater treatment system provides pH neutralization using lime, grit removal, deep tank aeration with 48-hour retention, and secondary clarification. Since process wastewaters from the mill are nutrient deficient, Domtar adds phosphoric acid and aqua ammonia to its treatment system to enhance biological treatment.

The treated effluent including process wastewater, stormwater, boiler blowdown, cooling tower blowdown, and wastewaters from other parties is discharged via Outfall 010. Noncontact cooling water is discharged via Outfall 015. The permit also includes three emergency overflow outfalls (011, 012, and 013). Outfall 014 in the permit represents the combined discharge from Outfall 010 and the emergency outfalls. There has not been a discharge from any of the emergency outfalls in the last 10 years.

Effluent from Outfall 010 is discharged to the Wisconsin River via a diffuser system, consisting of eight, 4-inch diameter nozzles spaced approximately 19 feet apart along a 140-foot, 36-inch diameter pipe on the bed of the Wisconsin River.

Attachment #3 is a map of the area showing the approximate location of the outfalls.

Existing Permit Limitations: The current permit, expiring on 09/30/2020, includes the following effluent limitations and monitoring requirements.

Outfall 010 – WWTP Effluent

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1
BOD_5						1
TSS						1
pH	11.0 s.u.	4.0 s.u.				2
Temperature						1
Phosphorus						1
Mercury						1
Chronic WET						1
Acute WET						1

Outfalls 011, 012, and 013 (Emergency Overflow Discharges)

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1
pH	9.0 s.u.	5.0 s.u.				
BOD_5						1
TSS						1
Phosphorus						1

Outfall 014 (010 and the Emergency Outfalls Combined)

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	6-Month Average	Rolling 12-Month Average	Footnotes
Flow Rate							1
BOD_5	17,314 lbs/day			9,000 lbs/day			3, 4
TSS	23,738 lbs/day			12,763 lbs/day			3
Phosphorus							5
Interim						0.42 mg/L	
Final				0.300 mg/L	0.100 mg/L 7.0 lbs/day		

Outfall 015 – Noncontact cooling water

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Rolling 12-Month Average	Footnotes
Flow Rate						1

Temperature						1
Chlorine	38 µg/L					

Footnotes:

1. Monitoring only.
2. The permittee shall maintain the pH of the discharge within the range of 5.0 to 9.0 standard units (s.u.) except excursions are permitted subject to the following conditions:
   - The pH is monitored continuously;
   - The total time during which the pH is outside the range of 5.0 to 9.0 s.u. shall not exceed 446 minutes in any calendar month;
   - No individual pH excursion outside the range of 5.0 to 9.0 s.u. shall exceed 60 minutes in duration;
   - No individual pH excursion shall be outside the range of 4.0 to 11.0 s.u.; and
   - For each day, the permittee shall report instantaneous maximum pH, instantaneous minimum pH, total time (minutes) that the pH is outside the range of 5.0 to 9.0 s.u. and the number of pH excursions outside the range of 5.0 to 9.0 that exceed 60 minutes in duration.
3. The listed limits in the table are categorical limits that are not re-evaluated in this memo.
4. Additionally, tables of daily mass BOD_5 limits for May through October are included in the permit in accordance with Table 4-m of ch. NR 212, Wis. Adm. Code. The permit requires daily river flow rate and temperature monitoring to determine the applicable WLA for each day.
5. A compliance schedule is in the current permit to meet the final WQBEL by February 1, 2023.

1) Receiving Water Information:

- Name: Wisconsin River
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm water sport fish community, non-public water supply.
- Low Flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following low flow values are from USGS Station 05398000, just downstream of where Outfalls 010 and 015 are located.
  $7\text{-}Q_{10}$ = 1042 cfs (cubic feet per second)
  $7\text{-}Q_2$ = 1422 cfs
  $1\text{-}Q_{10}$ = 819 cfs
  $90\text{-}Q_{10}$ = 1209 cfs (estimated as 85% of $7\text{-}Q_2$)
  Harmonic Mean Flow = 2102 cfs using flow data from 10/01/1986 to 08/28/2014

- Hardness = 44 mg/L as $CaCO_3$. This value represents the geometric mean of data from 6 WET tests from March 2013 to March 2019
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: A chronic mixing zone of 47% is used for Outfall 010 as determined by an October 2, 1990 mixing zone study, allowed by the diffuser structure. The NCCW from Outfall 015 is not discharged by the diffuser so the default chronic mixing of 25% is used for Outfall 015 and the combined discharges for calculating temperature limits.
- Source of background concentration data: Metals and chloride data from the Wisconsin River at Wausau (Station ID 373001) is used for this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: Domtar Paper Company discharges at the same location as LignoTech and

shared assimilative capacity between the two facilities is considered in this memo. Phosphorus loads have been allocated between the discharges by the Wisconsin River TMDL. Overlapping mixing zones for temperature are considered in Part 5.

- Impaired water status: This segment of the Wisconsin River is listed as impaired for mercury and PCBs based on fish tissue.

2) Effluent Information:

- Flow Rates: from reported data from April 2015 to March 2020 in MGD (Million Gallons per Day)

	010 WWTP (014 flows are equal)	015 NCCW
Peak 365-Day Average	8.64	5.00
Peak Daily	12.5	6.90
Peak 7-Day Average	12.2	6.58
Peak 30-Day Average	11.3	6.41
Overall Average	7.91	4.25

The peak 365-day average flow rates of 8.64 MGD and 5.00 MGD at Outfalls 010 and 015 respectively are used as the representative effluent flow rates for most WQBEL calculations in this memo.

- Hardness = 843 mg/L as $CaCO_3$. This value represents the geometric mean of permit application data for Outfall 010 and WET testing data from April 2018 to March 2019
- Acute dilution factor used in accordance with s. NR 106.06 (3) (c), Wis. Adm. Code: A ZID of 18:1 ($Q_{mix}/Q_{effluent}$) is used for Outfall 010, based on an October 2, 1990 study. No ZID applies to Outfall 015.
- Water Source: The primary water source for the mill is an intake structure on the Wisconsin River (~90% of source water). A small amount of source water also comes from private wells on-site (~9%) and municipal supply (~1%).
- Additives: Sodium hypochlorite and sodium bisulfite are used in the noncontact cooling water discharge (Outfall 015). Four biocides and 14 water quality conditioners are used in mill processes but are expected to be removed by the treatment process and will not be discharged at Outfall 010.
- Total Phosphorus Wasteload Allocation: 9,218 lbs/year (see Appendix K of the TMDL document)
- Effluent characterization: This facility is categorized as a primary industrial discharger, so the permit application required effluent sample analyses for all the "priority pollutants" except for the pesticides, dioxins and furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code at Outfall 010 . The permit-required monitoring for phosphorus and temperature from April 2015 to March 2020 and mercury monitoring from July 2014 to January 2020 is used in this evaluation.

  Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.".

Sample Date	Copper µg/L
08/21/2019	<8
10/14/2019	<1.6
10/29/2019	6.1

Attachment #1

Sample Date	Copper µg/L
11/11/2019	3.7
Average	2.5

"<" means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

The following table presents the average concentrations and loadings at Outfalls 010 and 015 from April 2015 to March 2020 for all parameters with limits or monitoring in the current permit to meet the requirements of s. NR 201.03(6):

	Outfall 010	Outfall 015
BOD_5	725 lbs/day	
TSS	1450 lbs/day	
pH field	7.05 s.u.	
Phosphorus	0.30 mg/L	
Mercury	1.68 ng/L	
Temperature	94 °F	78 °F
Chlorine		0.33 µg/L

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC (or 19 times the ATC due to the ZID applicable to this facility). However, changes to ch. NR 106, Wis. Adm. Code (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105
Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10})
Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.
f = Fraction of the effluent flow that is withdrawn from the receiving water, and
Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. However, Domtar has a ZID of 18:1 and acute limits calculated using the 1-Q_{10} method above would be less stringent than limits calculated based on the ZID. Acute limits will continue to be calculated with the ZID ratio of 18:1.

The following tables list the calculated water quality-based effluent limitations for Outfall 010 along with the results of effluent sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 18:1 according to the ZID for Outfall 010

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.0	343	68.5	<20		
Arsenic		340	6116	1223	<1.0		
Cadmium	457	58.9	1060	212	<0.95		
Chromium	301	4446	80025	16005	<4.2		
Copper	495	70.2	1263	253	2.5		
Lead	356	365	6564	1313	<22		
Mercury (ng/L)		830	14940			4.6	4.2
Nickel	268	1080	19445	3889	<5.5		
Zinc	333	345	6204	1241	<18		
Chloride (mg/L)		757	13626	2725	79		
Barium**		3077.3	55391	11078	150		
Boron**		17625	317250	63450	130		
Phenols**		4460.3	80285	16057	360		
Manganese**		1682.68	30288	6058	570		

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
** The limit for this substance is based on a secondary value.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 489.7 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06 (4) (c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28	-	267	53	<20	
Arsenic		152.2	10	5234	1047	<1.0	
Cadmium	44	1.30	0.23	40	8	<0.95	
Chromium	44	67.66	3.0	2378	476	<4.2	
Copper	44	5.14	4.7	21	4	2.5	
Lead	44	12.72	3.4	346	69	<22	
Mercury (ng/L)		440	3.4	16042			6.5
Nickel	44	26.15	0.00	961	192	<5.5	
Zinc	44	58.92	1.6	2107	421	<18	
Chloride (mg/L)		395	6.5	14278	2856	79	
Barium*		170.96	-	6280	1256	150	
Boron*		979	-	35963	7193	130	
Phenols*		2197.2	-	80712	16142	360	
Manganese*		93.48	-	3434	687	570	

* The limit for this substance is based on a secondary value.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 568.1 cfs (¼ of the 90-Q_{10}), as specified in s. NR 106.06 (4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Mercury (ng/L)	1.3	3.4	1.3			4.7

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 987.9 cfs (¼ of Harmonic Mean) as specified in s. NR 106.06 (4), Wis. Adm. Code

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370	0.23	27364	5473	<0.95	
Chromium (+3)	3818000	3.0	282536033	56507207	<4.2	
Lead	140	3.4	10112	2022	<22	
Mercury (ng/L)	1.5	3.4	1.5			4.7
Nickel	43000	-	3182048	636410	<5.5	
Boron*	165800	-	12269385	2453877	130	

* The limit for this substance is based on a secondary value.

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 987.9 cfs (¼ of Harmonic Mean) as specified in s. NR 106.06 (4), Wis. Adm. Code

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	10	254.2	50.84	<1.0

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for mercury.

Total Residual Chlorine – Because chlorine is added at Outfall 015, continued effluent limitations are recommended to assure proper removal of chlorine prior to discharge. Specifically, a daily maximum limit of 38 µg/L (38.06, rounded to two significant figures) at Outfall 015 is required. Weekly average limitations are not needed based on reasonable potential as the daily maximum limitations will provide adequate protection of the resource.

In addition, expression of limits requirements in s. NR 106.07(4), Wis. Adm. Code requires that industrial permits contain daily maximum and monthly average limitations whenever limits are practicable and necessary to protect water quality. The methods for calculating limitations for industrial discharges are specified in s. NR 106.07(4), Wis. Adm. Code, as follows:

> Whenever a daily maximum limitation is determined necessary to protect water quality, a monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

Therefore, a monthly average limit of 38 µg/L at Outfall 015, set equal to the daily maximum limit, is recommended in the reissued permit.

Mercury – Based on the effluent concentrations at Outfalls 010 mercury alone, mercury limits would be needed. However, updates to s. NR 106.06(6) allow a facility to demonstrate that an intake pollutant in the discharge does not cause, have the reasonable potential to cause, or contribute to the excursion of water quality criteria in the receiving water. The demonstration has five conditions:

1. The permittee withdraws 100 percent of its intake water containing the substance from the same body of water into which the discharge is made;
2. The permittee does not contribute any additional mass of the substance to the wastewater;
3. The permittee does not alter the substance chemically or physically in a manner that would cause adverse water quality impacts to occur that would not occur if the pollutants were left in-stream;

4. The permittee does not increase the concentration at the edge of the mixing zone, or at the point of discharge if a mixing zone is not allowed, as compared to the concentration in the intake water, unless the increased concentration does not cause or contribute to an excursion above an applicable water quality standard; and
5. The timing and location of the discharge would not cause adverse water quality impacts to occur that would not occur if the identified intake pollutant were left instream.

The following table summarizes available effluent and intake mercury monitoring data:

Mercury (ng/L)		
	Outfall 010	Intake 601
07/14/2014	2.2	3.5
10/20/2014	2.1	2.7
01/21/2015	1.1	1.6
04/08/2015	1.5	3.7
07/14/2015	1.3	1.7
06/26/2017	1.1	
08/28/2017	1.3	
10/09/2017	0.9	
01/11/2018	1.4	
04/23/2018	1.4	
07/16/2018	0.8	
10/15/2018	1.4	5.9
01/03/2019	2.1	2.3
04/08/2019	1.6	6.7
07/22/2019	4.2	6.9
10/09/2019	2.4	3.6
01/06/2020	2.1	3.2
1-day P_{99}	4.4	10.2
4-day P_{99}	2.8	6.5
30-day P_{99}	2.1	4.7
Mean	1.7	3.8

Outfall concentrations on each paired sampling day are lower than the respective intake concentrations. Based on this data and information on the discharge, conditions 3, 4, and 5 are met. However, only 90% of the source water for Domtar is intake from the Wisconsin River, so condition 1 is not met. Since not all five conditions are met, a numeric mercury limit is needed. In this case, limits should be calculated in accordance with s. NR 106.06(6)(c)2c, Wis. Adm. Code. The effluent limit should be calculated as a flow-weighted sum of these two values:

- For the intake fraction (90%): The representative background concentration. This is calculated as the 1-day P_{99} of receiving water data, which is equal to 10.2 ng/L (s. NR 106. 06(6)(d), Wis. Adm. Code)
- For the remainder of the source water (10%): The applicable water quality criteria (1.3 ng/L)

$$WQBEL = (0.90 \times 10.2\,ng/L) + (0.10 \times 1.3\,ng/L)$$
$$= 9.3 \text{ ng/L}$$

A limit of **9.3 ng/L at Outfall 010 as a monthly average** is recommended in the reissued permit. In addition, a corresponding mass limit is needed in accordance with s. NR 106.07(2), Wis. Adm. Code. The mass limit should be expressed as a monthly average and set equal to 400 g/day based on the maximum 30-day average flow rate of 11.3 MGD (9.3 ng/L × 11.3 MGD × 3.78 L/gallon). Additional limits to meet expression of limits requirements in s. NR 106.07(4), Wis. Adm. Code, are not required because the reasonable potential for this limit is not shown under s. NR 106.05.

Polyaromatic Hydrocarbons (PAH) – Point source wastewater discharges containing PAH compounds are regulated using the best professional judgement (BPJ) technology-based limitation. Lack of reasonable potential to exceed the limit can be demonstrated by a no-detect of all PAH compounds or by reporting the sum of the PAH group of 10 detected amounts to be equal to or less than 0.1 µg/L. An alternate method for summing PAH compounds is also available, using a toxicity equivalency factor (TEF) from the guidance document: *PAH Group of 10 Calculation Using Toxicity Equivalent Factors*.

The permit application included monitoring for PAH compounds, several of which were detected in the effluent. The detected PAH compound concentrations and their respective TEF are listed in the table below. Because the sum of the sample results multiplied by the respective TEF is less than 0.1 µg/L, no limits for PAH compounds are required.

	Effluent concentration result (µg/L)	TEF	Product (TEF × effl. conc.)
Benzo(a)anthracene	0.042	0.1	0.0042
Benzo(ghi)perylene	0.034	0.001	0.000034
Chrysene	0.032	0.001	0.000032
Dibenzo(a,h)-anthracene	0.082	1	0.082
Indeno(1,2,3-cd)-pyrene	0.13	0.1	0.013
		Total	**0.0993**

Hexavalent chromium

The permit application included a Cr^{6+} monitoring result of 110 µg/L and a non-detect total Cr result of <0.95 µg/L. Measured Cr^{6+} concentrations should not be higher than respective total Cr concentrations. The Cr^{6+} test is known to be prone to interferences that cause false high values. Therefore, this test result was excluded from the WQBEL evaluation.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic

toxicity to aquatic life. Given the fact that Domtar does not currently have ammonia nitrogen limits the need for limits is evaluated at this time.

Ammonia-Nitrogen at Outfall 010 (mg/L)	
03/04/2019	0.454
05/13/2019	<0.170
06/10/2019	1.185
09/17/2019	<0.170
Average	0.410

Considering the high level of dilution available in the receiving water, these effluent concentrations are well below the lowest ammonia limits that would be calculated. Therefore, no ammonia limits or monitoring are recommended in the reissued permit.

PART 4 – PHOSPHORUS

Technology Based Phosphorus Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial facilities that discharge greater than 60 pounds of Total Phosphorus per month to comply with a 12-month rolling average limit of 1.0 mg/L, or an approved alternative concentration limit. Because Domtar currently has a limit of 0.42 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent water quality-based concentration limit is given. In addition, the need for a WQBEL for phosphorus must be considered.

Water Quality-Based Effluent Limits (WQBEL)
TMDL Limits – Phosphorus
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (May 2020). The wasteload allocations (WLA) found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin (WRB TMDL)* report dated April 26, 2019 are expressed as maximum annual loads (lbs/year) and maximum daily loads (lbs/day). The WLA specified in Appendix J are no longer applicable since the site-specific criteria were approved by EPA on June 9, 2020. The daily WLAs in the WRB TMDL equals the annual WLA divided by the number of days in the year. Therefore, the daily WLA is an annual average. Since the derivation of daily WLAs from annual WLAs does not take effluent variability or monitoring frequency into consideration, maximum daily WLAs from the WRB TMDL should not be used directly as permit effluent limits.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL.

Therefore, limits given to continuously discharging facilities covered by the WRB TMDL are given monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

TP Equivalent Effluent Concentration = Daily WLA ÷ (Flow Rate * Conversion Factor)
= 25.2 lbs/day ÷ (8.64 MGD × 8.34)
= 0.350 mg/L

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required.

TP Monthly Average Permit Limit = daily WLA * monthly average multiplier
= 25. 2 lbs/day × 1.3
= 32.8 lbs/day

The multiplier used in the monthly average calculation was determined according to TMDL implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data at Outfall 014, to be 0.42. The facility is able to meet the permit limits based on the WLA so the current CV is used. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as 3x weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

The WRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Wisconsin River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are no longer required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

Effluent Data

The following table lists the statistics for effluent phosphorus levels from July 2014 to March 2020 from Outfall 014 for informational purposes. Since mass discharge reporting is not required in the current permit, the mass is calculated using the reported phosphorus concentration and the effluent flow rate for that day. There have been zero exceedances of the calculated monthly average mass limit in this date range. The maximum monthly average phosphorus discharge was 32.1 lbs/day and the monthly average discharge was below 27.8 lbs/day 95% of the time. Therefore, no compliance schedule or interim limit is recommended in the reissued permit.

Total Phosphorus Statistics		
	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	0.70	43.5
4-day P_{99}	0.47	29.3
30-day P_{99}	0.35	22.0
Mean	0.29	18.5
Std	0.13	7.7

Sample Size	908	908
Range	0.04 - 1.37	0.020 - 63

Conclusions:

In summary, the following limits are recommended by this evaluation:

- Monthly average Total Phosphorus mass limit of 33 lbs/day
- Continued 12-month rolling average concentration limit of 0.42 mg/L

PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

Because the mixing zones from the discharges from Outfalls 010 and 015 may overlap with the discharges from LignoTech's Outfalls 001 and 002, temperature limitations are calculated for the combined flow rates from all four discharges. The combined f value of 0.91 is calculated flow proportionally based on information from the two facilities

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values are from the daily sums of actual flow reported at each of the from each of the four discharges from April 2015 to March 2020.

Effluent temperatures for determining reasonable potential were calculated as a flow weighted average of daily temperatures from each of the four discharges using individual daily temperature and flow measurements. The table below summarizes the maximum of these temperatures reported during monitoring from April 2015 to March 2020.

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	88	90	NA	120
FEB	88	90	NA	120
MAR	91	93	NA	120
APR	90	93	NA	120
MAY	92	96	107	120
JUN	95	98	107	120
JUL	97	100	119	120
AUG	98	99	118	120
SEP	95	95	NA	120
OCT	92	94	NA	120
NOV	89	92	NA	120

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Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
DEC	90	91	NA	120

Reasonable Potential
Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data **no effluent limits are recommended for temperature**. The complete thermal table used for calculation is attached. Continued effluent temperature monitoring is recommended in the reissued permit.

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the WET Program Guidance Document (October 29, 2019).

- A zone of initial dilution (ZID) has been approved for this discharge, according to the requirements set forth in s. NR 106.06(3)(c), Wis. Adm. Code. To assure that the discharge from Outfall 010 is not acutely toxic to organisms at the edge of the mixing zone, WET tests must produce a statistically valid LC_{50} (Lethal Concentration) greater than the acute mixing zone (AMZ) concentration. The AMZ of 18% shown in the WET Checklist summary below was calculated according to the following equation:

$$AMZ\ (as\ \%) = (100 / Q_e + Q_s\ ratio) \times 3.3$$
$$= (100/18) \times 3.3$$
$$= 18\%$$

Where "$Q_e + Q_s$ ratio" is the ratio of the receiving water after it has mixed with the effluent compared to the effluent alone. For example, a ratio expressed as 19.5 (or 19.5:1) means that 18.5 parts receiving water is mixing with 1-part effluent.

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09 (3) (b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 3% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 8.64 MGD = 13.4 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0.90
Q_s = 47% of the 7-Q_{10} based on the mixing zone study= 47% × 1042 cfs = 489.7 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in acute and chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 010 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 010. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08 (3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. Data collected prior to 2004 was not used in WET determinations due to changes in WET testing procedures around this time.

WET Data History

Date Test Initiated	Acute Results LC_{50} % (% survival in 100% effluent)				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
07/27/2004	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/11/2005	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

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Date Test Initiated	Acute Results LC_{50} % (% survival in 100% effluent)				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead	Pass or	Used in	*C. dubia*	Fathead	Pass or	Use in	
08/21/2007	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
11/04/2008	>100	>100	Pass	Yes	>100	**31.3**	Pass	Yes	
08/25/2009	>100	>100	Pass	Yes	**48.1**	>100	Pass	Yes	
11/02/2010	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
08/23/2011	>100	>100	Pass	Yes	**57.1**	>100	Pass	Yes	
05/22/2012	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
03/05/2013	>100	>100	Pass	Yes	**39.6**	>100	Pass	Yes	
11/10/2015	>100	>100	Pass	Yes	**80.1**	>100	Pass	Yes	
12/19/2016	>100	>100	Pass	Yes	**51.2**	>100	Pass	Yes	
09/19/2017	>100	>100	Pass	Yes	>100	**55**	Pass	Yes	
04/23/2018	>100	>100	Pass	Yes	**50**	>100	Pass	Yes	
03/19/2019	>100	>100	Pass	Yes	**7.8**	>100	Pass	Yes	

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

  According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

  Acute Reasonable Potential = $0 < 1.0$, reasonable potential is not shown, and a limit is not required.

  Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(5)(c), Wis. Adm. Code, Table 4)	IWC
100/7.8 = 12.8	1.8 Based on 9 detects	3%

[(TUc effluent) (B)(IWC)] = $0.69 < 1.0$

Therefore, no reasonable potential is shown for acute and chronic WET limits using the procedures in s. NR 106.08(6) and representative data from 2004 to 2019.

The WET Checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The Checklist indicates whether acute and chronic WET

limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The Checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the Checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET Checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET Checklist, see Chapter 1.3 of the WET Guidance Document: http://dnr.wi.gov/topic/wastewater/WETguidance.html.

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WET Checklist Summary

	Acute	Chronic
AMZ/IWC	AMZ = 18%. **0 Points**	IWC = 3%. **0 Points**
Historical Data	No detects or failures **0 Points**	9 detect tests used to calculate RP. No tests failed. **0 Points**
Effluent Variability	Little variability, no repeat violations or upsets, consistent operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	WWSF **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Limits for zero substances based on ATC; Cu, Hg, and chloride detected. (3 pts) Additional Compounds of Concern: Phenols and multiple PAH compounds detected (2 pts) **5 Points**	Limits for zero substances based on CTC; Cu, Hg, and chloride detected. (3 pts) Additional Compounds of Concern: Phenols and multiple PAH compounds detected (2 pts) **5 Points**
Additives	No additives discharged **0 Points**	Same as acute **0 Points**
Discharge Category	Pulp or Paper Mill **15 Points**	Same as Acute. **15 Points**
Wastewater Treatment	Secondary Treatment **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**25 Points**	**25 Points**
Recommended Monitoring Frequency (from Checklist):	3 tests during permit term (year 1, 3, 5, etc.)	3 tests during permit term (year 1, 3, 5, etc.)
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

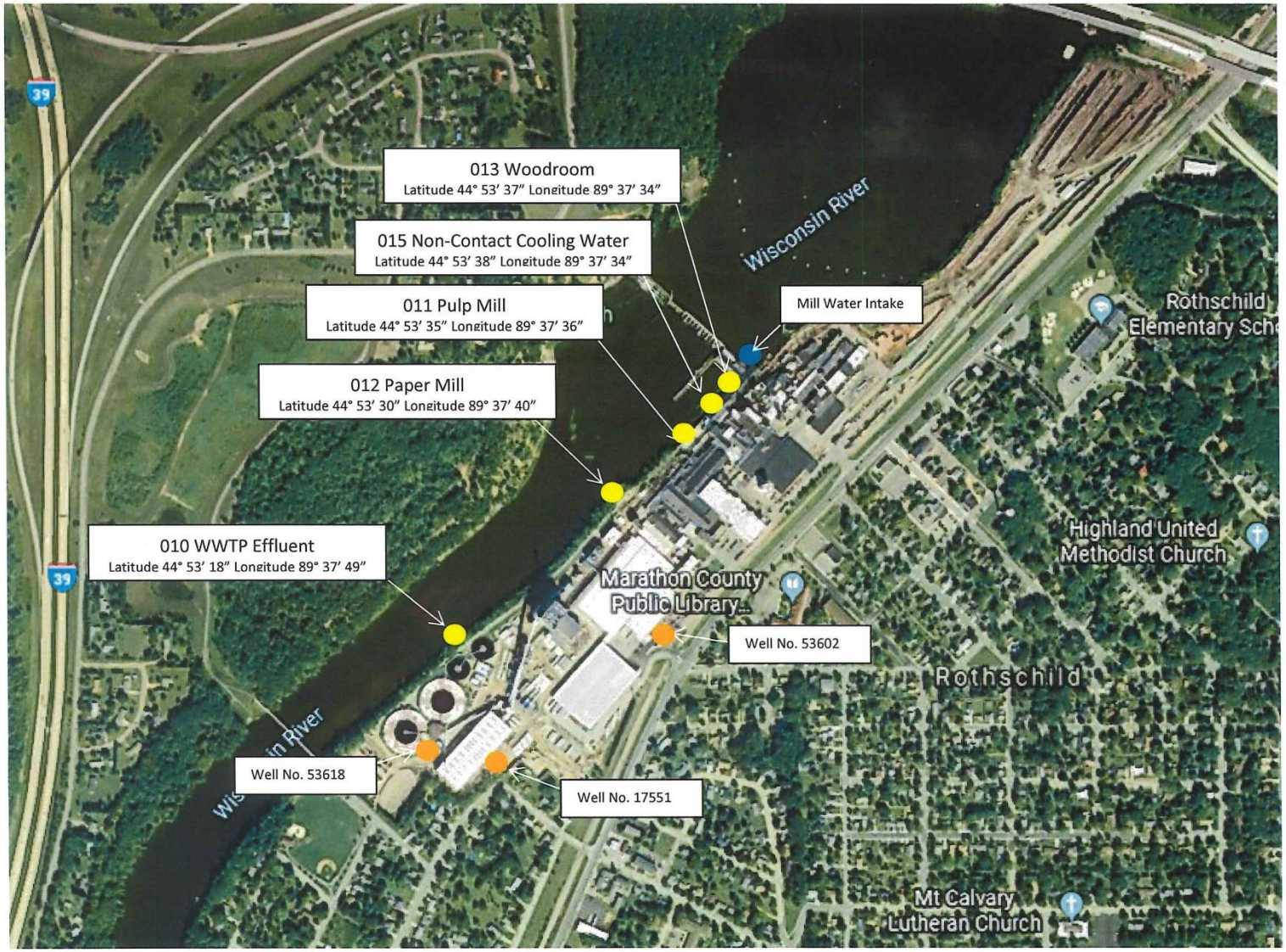
After consideration of the guidance provided in the Department's WET Program Guidance Document (2019) and other information described above, **annual acute and chronic WET tests are recommended** in the reissued permit. Based on the checklist point totals alone, 3x permit term acute and chronic WET testing would be recommended. However, a minimum of annual acute and chronic monitoring is recommended because Domtar is a Primary Industry. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

					Temp Dates	Flow Dates
Facility:	Domtar and LignoTech	**7-Q_{10}:**	1042.00 cfs			
Outfall(s):	010, 015, LignoTech 001 and 002	**Dilution:**	25%	**Start:**	04/01/15	04/01/15
Date Prepared:	08/18/2020	**f:**	0.91	**End:**	03/31/20	03/31/20
Design Flow (Qe):	15.43 MGD	**Stream type:**	Large warm water sport or forage fish co			
Storm Sewer Dist.	0 ft	**Qs:Qe ratio:**	10.9 :1			
		Calculation Needed?	**YES**			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	1042.00	9.569	9.981	0.91	88	90	NA	120
FEB	33	50	76	1042.00	9.765	11.227	0.91	88	90	NA	120
MAR	36	52	76	1042.00	9.495	11.070	0.91	91	93	NA	120
APR	46	55	79	1042.00	13.053	13.666	0.91	90	93	NA	120
MAY	60	65	82	1042.00	17.960	18.765	0.91	92	96	107	120
JUN	71	75	85	1042.00	18.661	19.506	0.91	95	98	107	120
JUL	75	80	86	1042.00	19.526	20.663	0.91	97	100	119	120
AUG	74	79	86	1042.00	19.492	19.788	0.91	98	99	118	120
SEP	65	72	84	1042.00	17.415	18.770	0.91	95	95	NA	120
OCT	52	61	80	1042.00	15.222	15.825	0.91	92	94	NA	120
NOV	39	50	77	1042.00	11.453	12.027	0.91	89	92	NA	120
DEC	33	49	76	1042.00	10.451	11.437	0.91	90	91	NA	120


013 Woodroom
Latitude 44° 53′ 37″ Longitude 89° 37′ 34″
015 Non-Contact Cooling Water
Latitude 44° 53′ 38″ Longitude 89° 37′ 34″
011 Pulp Mill
Latitude 44° 53′ 35″ Longitude 89° 37′ 36″
012 Paper Mill
Latitude 44° 53′ 30″ Longitude 89° 37′ 40″
010 WWTP Effluent
Latitude 44° 53′ 18″ Longitude 89° 37′ 49″
Mill Water Intake
Well No. 53602
Well No. 53618
Well No. 17551
Wisconsin River
Rothschild Elementary Sch
Highland United Methodist Church
Marathon County Public Library
Rothschild
Mt Calvary Lutheran Church
39